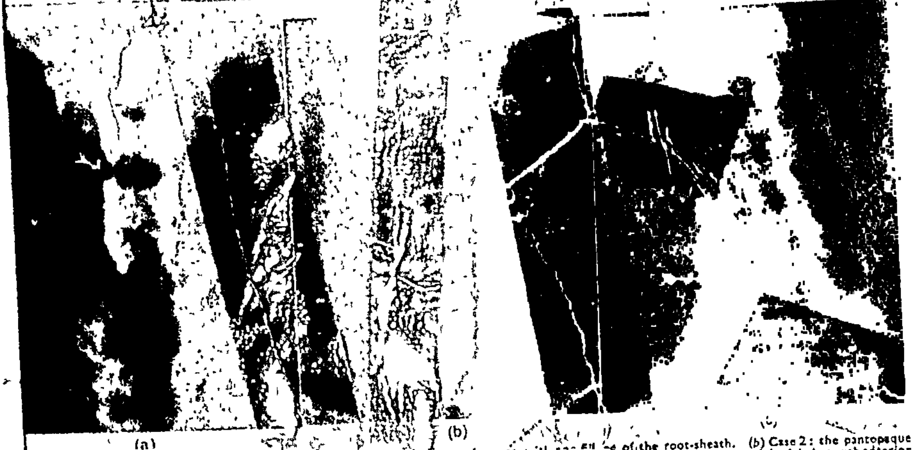

[illegible] of the root-sheath. (b) Case 2: the pantopaque [illegible] showing narrowing of the 6th disc with anterior [illegible]

l metacarpals. It was 10 days before he realised [illegible] his head to the [illegible] sharp pain was produced by inclining his head to the right, [illegible] that it could be eased by putting his head to the right [illegible] down between his knees. Seven weeks after onset he [illegible] noticed paræsthesiæ, consisting of a severe tingling of [illegible] middle and ring fingers. At this

[illegible] to prevent him from [illegible] improving but was still [illegible] as after onset: the pain was [illegible]

47

[illegible] tilt over to the right.

Examination: Carried head [illegible] and [illegible] and [illegible] was slight tenderness over the [illegible] limitation of left [illegible] to the left of this area. There was [illegible] flexion because this produced pain. There was wasting and flabbiness of the left triceps and extensors [illegible] and slight [illegible] There was weakness of the left triceps and slight [illegible] of the left wrist and fingers. No [illegible] absent; other reflexes [illegible] X ray showed [illegible] space between the [illegible] was marginal lipping [illegible] to encroach on the [illegible] graphy showed non- [illegible] ligament. [illegible] of the left 7th cervical nerve-root sheath with good [illegible] at other levels.

[illegible] patient was treated by rest until the pain cleared up [illegible] months after onset he was pain free. The left triceps [illegible]

[illegible] of the left 7th cervical root, [illegible] spontaneous remission.

CASE 4.—Male, aged [illegible] While playing rugby in late [illegible] he was handed off by a blow on the left side of the neck. [illegible] days later he developed a pain above the left scapular [illegible] across the posterior [illegible] of the left upper arm [illegible] to the index and [illegible] ache on which [illegible] at the painful [illegible] developed a sensation [illegible] A fortnight after the [illegible] upper arm and along [illegible] severe electric current drop in the [illegible] to the thumb and index. [illegible] lateral [illegible] produced by bending [illegible] was [illegible] A diagnosis of brachial [illegible] head [illegible] with physiotherapy. [illegible] was made and he was treated [illegible] and was made worse by [illegible] condition varied in intensity [illegible] In August, [illegible] as when running or being in a bumpy car. [illegible] his neck was manipulated without anæsthesia and all

[illegible] used. There was now involvement of the right arm with radiation of pain and paræsthesiæ into the thumb, index and middle fingers of the right hand. This attack lasted 2 months. Pain was increased by a lumbar puncture. The spinal fluid was normal in all respects. From October, 1943, he had several sharp attacks of pain and paræsthesiæ lasting for a week each, particularly after physical effort. He was admitted to this hospital in [illegible] 1944, because of a severe attack of pain and tenderness [illegible] upper part of the left trapezius. He also had pains [illegible] arms running into the thumbs and outer fingers.

On examination: Very slight limitation of [illegible] flexion of cervical spine, with no tenderness [illegible] triceps was flabby and a little weak and there [illegible] weakness of the extensors of the left wrist. [illegible] jerk was lost. There was no constant sensory [illegible] on repeated examination. The rest of the nervous system was normal. Paræsthesiæ could [illegible] left [illegible] head [illegible] comp[illegible] almost complete disappearance of the [illegible] between the 6th and 7th cervical vertebræ [illegible] lipping was present with a little forward [illegible] oblique views the marginal lipping was [illegible] upon the intervertebral foramina on either [illegible]

This patient was given a leather collar [illegible] no further acute episodes, though [illegible] paræsthesiæ are still present.

Comment: A lesion of the 7th cervical [illegible] with radiological evidence of side-to-side [illegible] intervertebral foramen.

CASE 5.—Female, aged 36. Abrupt onset [illegible] part of neck and between the scapulæ [illegible] passing next day from root of neck down [illegible] arm and forearm to the radial [illegible] located the pain especially in the [illegible] just below the head of radius, [illegible] movements of the arm [illegible]

On examination: [illegible] for lateral inclination [illegible] produced pain down [illegible] the lower cervical [illegible] free edge of the [illegible] needling. The [illegible] sors of forearm [illegible] of the index [illegible] jerk was abs[illegible] CSF normal [illegible] showed [illegible]

[illegible] girdle [illegible] spasm [illegible] maximum [illegible] procaine [illegible] relief of pain [illegible] mean that [illegible] root [illegible] of the spine. [illegible] Only in the [illegible] of movement. [illegible] lateral flexion or [illegible] pressure on the head [illegible] paræsthesiæ in the [illegible] tending to squeeze [illegible] by narrowing [illegible] Spurling's [illegible] manœuvre and is [illegible] forward pressure on [illegible] is tilted towards [illegible] produced but it [illegible] set of symptoms [illegible] the active phase [illegible] be a reduction of [illegible] narrowing of the 6th cervical [illegible] of the margins of the [illegible] with anterior lipping, and [illegible] intervertebral [illegible] inasmuch as [illegible] side to side than from [illegible] further reduction of its width by a [illegible] will compress the emerging root [illegible] in this situation is best seen in [illegible] changes such as these are however at [illegible] They are common in people without [illegible] accurate information is derived from [illegible] graphy. Pantopaque is used for this [illegible] its fluidity, unlike 'Lipiodol,' enables cases in which this was done a filling defect was demonstrated opposite the 6th cervical disc on the affected side and—more important—the dural sleeve surrounding the root did not fill, in contrast to the good filling of the unaffected roots above and below. This obliteration of the root sac confirms the presence of a pathological process, and in conjunction with a filling defect or notch in the column of pantopaque suggests that the non-filling is due to a herniation of the disc at that level. These radiological findings were identical with those of Spurling and Scoville (1944), in cases of operatively verified herniations.

TREATMENT

Treatment is essentially conservative. In none of our cases was surgery considered necessary. The important factor is rest to the neck. This is done automatically by the patient when he fixes the head in the easiest position. If pain is very acute then rest in bed with careful adjustment of the pillows is necessary and effective doses of the simpler analgesics should be used. In every case, whether confined to bed or not, a review of the sleep position must be made and the most suitable height of pillows found by trial. According to Spurling and Scoville continuous head traction by a harness using 10–12 lb. weight will relieve pain in any case and the majority will remain symptom-free after 3–5 weeks. None of our cases has been severe enough to require this. As a lesser or continuation measure a well-fitting leather collar worn during the day will suffice. If these measures fail after adequate trial then surgery may be tried (Spurling and Scoville 1944, Semmes and Murphy 1943).

DISCUSSION

Trauma is not an essential precursor of the syndrome and even when present it may be no more severe than the minor traumata which may happen to anyone. Sometimes however there is a specific blow or twist which may precede the symptoms so closely that it is impossible to ignore it. Occasionally there is a history of cricks in the neck for months or even years before pain begins but these cricks differ in no way from those occurring in patients in whom no subsequent symptoms develop. It therefore seems necessary to invoke a degenerative as well as a traumatic factor.

It is thought that degenerative changes in the nucleus pulposis precede herniation in those cases which start with either slight trauma or no trauma at all. The nuclear material found at operation is usually softer and less elastic than normal, and may spontaneously exude when the annulus is incised. Haglund (1942), describing autopsy studies on posterior, posterolateral and lateral herniations in the cervical region, shows how the nuclear material pushes aside the surrounding laminæ of the annulus in tracking towards the periphery, and demonstrates compression of cervical roots, together with a case of kinking of the vertebral artery by a lateral protrusion. He quotes Jonsson's (1939) findings in support of the degenerative nature of the process underlying prolapse. It is our present view that if the annulus holds firm the nuclear material may herniate into the body of the vertebra above or below, producing a Schmorl's node. But if the annulus is weakened by degeneration or by the presence of a congenital defect, a comparatively minor trauma will force the swollen nucleus through it. This is admittedly an entirely theoretical conception, which arises from the frequent association of Schmorl's nodes and posterolateral herniations in the same subject, and from the trivial nature of the trauma in many cases. In the lumbar region the mechanism is thought to be exactly the same. The greater frequency of ruptured lumbar discs is probably due to their having to take the body-weight and their chances of trauma being greater.

The clinical picture presented by these cases stands out in clear-cut contrast to the other forms of pain in the upper limb with which they have hitherto been confused. Root symptoms occurring in the presence of radiological evidence of cervical spondylitis osteoarthritica have long been recognised (Hanflig 1936, Turner and Oppenheimer 1936) but without the realisation that the symptoms were due to the involvement of a single root by a herniation of the disc. In the absence of radiological changes they have been attributed to a
primary "radiculitis" or "brachial
associated with well-marked tenderness
of the shoulder girdle they are con
fibrositic, and any paræsthesiæ or ob
changes were attributed to a spread of
involve the nerves of the brachial plexus.
of trigger areas, which when pressed on
in the arm, is often accepted as co
of fibrositis, and, if infiltration of the
procaine relieves the pain, proof is
(Steindler and Luck 1938). It has
elsewhere (Elliott 1944) that such
in the presence of root lesions, and
procaine does not exclude such a lesion.
hypothetical entity, without known p
does occur it is difficult to imagine how
could spread from the muscles of the
through the cervical fascia to involve a
implication of a prolapsed disc, on the
only explains the combination of
reflex and sensory signs on a unila
brings this form of brachial pain into line
established condition of radicular sc

Diagnosis in these cases was based
picture and confirmed by the use of r
graphy in three cases. Surgical v
obtained because the natural course of
towards spontaneous recovery.[1] It is
should be reserved for recurrent se
shared by Spurling and Scoville.
herniations of the 5th cervical disc
root, and although none have been
series it is thought that Semmes and
tion of lesions at this and other levels
realised now that attention has been
possibility.

SUMMARY

Eight cases of brachial pain are des
They showed a uniform distribution
back of the shoulder, down the back
the radial border of the forearm, and
upper pectoral region. There were
thumb, index and middle fingers. In
was a history of acute stiff neck.

The signs included limitation of
neck; pain produced in the arm by
the neck and by downward pressure on
tenderness, weakness, and wasting of the
pectoralis major, triceps and extensors
fingers. The triceps jerk was reduced
there was usually hypo-algesia on the
finger.

The clinical picture was that of a le
cervical root.

Contrast myelography in three cases
defect opposite the 6th intervertebral
the 7th cervical root on the affected side

The clinical and radiological evidence
the brachial pain was caused by a her
cervical intervertebral disc.[1]

We are indebted to Major Hugh Dav
radiological investigations; and to Lieut
Greenway, RAMC, for permission to use hos

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[1] This has subsequently been confirmed by
similar cases not included in the above s

NOUS SINUS THROMBOSIS
ATED WITH PENICILLIN

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PLYMOUTH

woman, aged 19, a machinist by occupa- ted to hospital on June 30, 1944, notified She had been treated at home for 4 days, ut 15 g. of sulphanilamide by mouth. had appeared on the tip of her nose a week t of her illness.

THE FIRST WEEK

she looked very ill, T 102 F P 90, R 22 per r part of her nose and forehead was œdema- red, and there was intense bilateral swelling so that it was almost impossible to inspect the causing pain. There was a small discharging left of the tip of the nose. White-cell count c.mm. (polymorphs 72%, lymphocytes 20% s). She was given sulphathiazole 1 g. every ives, with copious fluids by mouth. Next little change; she was restless and delirious. ugh her temperature was still high, she was her eyes showed slight but definite proptosis, the diagnosis of cavernous sinus thrombosis. temperature began to fall and remained at her general condition had deteriorated and s and resentful of all interference. There osis of both eyes, and intense œdema of h chemosis. The optic discs showed intense Six days after admission (July 5) she showed in spite of just over 30 g. of sulphathiazole this was therefore discontinued. It was illin held out the only chance of recovery a supply became available. As soon as it units was given intravenously at 4.15 PM a similar dose was given intramuscularly at from the boil on her nose, which had not ed, showed coagulase-positive *Staph. aureus*, illin-sensitive. Next day she was given of penicillin at 10 AM and 7 PM. There was ling in the left eyelids and a good deal less face. The temperature dropped to normal condition was much improved. Red cells c.mm., Hb 67%, colour-index 0·87, white c.mm. (polymorphs 82%, lymphocytes 16%, s). There was s [illegible] pupils, and ocul [illegible] the patient was [illegible] eyelids on both sides was much more localised. 000 units of penicillin was administered at of 500,000 units in 3 days. At 7 PM the patient very well.

she improved still further. The œdema of the subsided enough for her to open both eyes gh both eyeballs were still immobile. A units of penicillin was given during the day.

LOPMENT OF ENCEPHALITIS

5 PM, the patient seemed somewhat drowsy l of headache and nausea, for which no ade- was found. Next morning her headache was was still drowsy and apathetic. There were ritis. White cells 20,000 per c.mm. (poly- lymphocytes 16%, monocytes 4%). Mr. C. examined her eyes and reported:

—Some proptosis. Movements very limited. lated but active. Media clear. Upper edge swollen and œdematous. Lower edge clear-

Slight proptosis. Movements a little better t, but very limited. Pupils active. Upper disc swollen and blurred. Central cup filled moderately dilated. Both eyes recovering dema.

he was still drowsy and uninterested in her The left eye was now almost normal and all had returned. In the right eye there was still ival chemosis, but the muscles had begun to actorily with the exception of the internal rectus. Two days later (13th) both eyes were almost normal, but there was some ptosis of the right upper lid. She complained of headache and vomited once or twice. Nothing could be found to account for this. She continued in much the same state for the next 4 days, when (17th) both lids of the right eye swelled up again and her conjunctiva became so œdematous that it hung down like a curtain. White cells 15,000 per c.mm. (polymorphs 68%, lymphocytes 27%, monocytes 5%). Mr. Tivy thought the reason might be some residual infection in the ethmoidal sinus, but X rays reveal no abnormality. Some improvement followed instillation of adrenaline into the eye, but her general condition steadily deteriorated.

On July 10 penicillin was resumed and she was given 100,000 units twice daily for 3 days. There was an instant response. Almost all her signs and symptoms disappeared except for slight proptosis of the right eye and occasional diplopia. White-cell count on the 22nd, 10,000 per c.mm. (polymorphs 71%, lymphocytes 27%, monocytes 2%). Two days later she was able to get out of bed for short periods, and her progress seemed very satisfactory. Apart from slight ptosis of the right upper lid there were no physical signs and her general condition remained excellent until the 28th, when she complained of headache and lassitude. Red cells 4,610,000 per c.mm., Hb 78%, CI 0·81; white cells 10,500 per c.mm. (polymorphs 68%, lymphocytes 30%, monocytes 2%). The headache became gradually more pronounced; it was centred over the left frontal region, was worse first thing [illegible] by nausea, occasional [illegible] which she thought was [illegible] repudiated by her att [illegible] been steady at 76–80, now rarely rose above 66 per min. Lumbar puncture showed a clear fluid under normal pressure; protein 85 mg. per 100 c.cm., globulin ++, an occasional lymphocyte present, no organisms. Blood WR negative. The headache became still more severe and constipation was now troublesome. There was pain and tenderness over the left frontal region, and her clinical conditions and the findings in the CSF strongly suggested an abscess in the left frontal lobe.

PROGRESS AT BURDEN INSTITUTE

At this stage she was admitted to the Burden Neurological Institute for further investigation and I am indebted to Surgeon Captain Lambert Rogers, RNVR, for the following notes.

On admission to the institute she was symptom-free. Slight bilateral proptosis and a patchy erythema of the upper part of the face. Fundi showed bilateral optic neuritis but no papillœdema. Eye movements normal. X ray of skull showed no abnormalities.

> *Electroencephalogram before operation* (Aug. 8).—There was a very large, very slow delta discharge in the left frontal lobe which tended to spread towards the left temporal region. The frequency of this discharge varied, at times being as slow as 0·5 c./s. at other times showing a frequency of up to 2 c./s. This finding suggests a lesion in the left frontal lobe. To discover the nature of this it will be necessary to repeat the EEG in about 7 days' time, but the general picture is like that of an abscess.

Operation on Aug. 10, by Surgeon Captain Lambert Rogers.—Burr hole in left frontal region. Left frontal lobe needled. No abscess found. Lobe soft and non-resistant to needle. Ventricle tapped CSF not under pressure. Wound closed. Lumbar puncture performed, pressure 200 mm., clear colourless fluid. CSF then allowed to escape and replaced by 10 c.cm. (10,000 units) of penicillin in head-down position. Patient rather drowsy and obfuscated after operation. Absent [illegible] than [illegible] There [illegible] left temporal region. The left frontal lobe now showed very little abnormality. The amplitude of the delta discharge was higher than was previously reported, but remained unusually slow in frequency at 0·5–1·5 c./s., suggesting a progressive rather than a recovering lesion in the left temporal region, probably involving the deeper structures as well.

By Aug. 25 she was much improved. No headache. No proptosis. No signs of a gross neurological lesion.

Dr. F. L. Golla, director of the institute, sent her back to the City Isolation Hospital on Sept. 5 with the following report:

"The slight bilateral proptosis together with the neuritic symptoms led the surgeons to consider that they probably had to deal with a frontal abscess. Nothing was found at operation. Penicillin was used as a precautionary measure and the patient has made an absolutely good recovery. One can only assume that there was at one time a marked inflammatory reaction simulating abscess and that this has now completely subsided."

On re-examination at this hospital the patient seemed very well and no abnormality whatever was found. The optic discs appeared normal. Red cells 4,150,000 per c.mm., Hb 74%, CI 0 89; white cells 7900 per c.mm. (polymorphs 63%, lymphocytes 31%, monocytes 6%). She was discharged on Sept. 7.

DISCUSSION

Septic thrombosis of the cavernous sinus has a high mortality-rate—almost 100%—and there is little doubt that but for the penicillin this patient would have died. Altogether she received 1,310,000 units. A similar case of unilateral cavernous sinus thrombosis treated at this hospital a few weeks ago succumbed, in spite of showing improvement at first with heavy dosage of sulphathiazole and sulphadiazine.

The case illustrates the following points. In cavernous sinus thrombosis following staphylococcal infection of the skin penicillin is probably the drug of choice and should if possible be used at the outset and continued until the infection is completely under control. Treatment should be continued at the earliest sign of relapse. If treatment [illegible] fails after say 20–30 g. of the drug. [illegible] to persist in further administration. Probably sulphathiazole would be better used while awaiting supplies of penicillin and stopped as soon as these became available. If in this case it had been possible to start penicillin therapy early and in adequate dosage, it is likely that rapid recovery would have ensued without complication. But the ultimate recovery suggests that even when a severe infection comes under treatment at a late stage penicillin is worth a trial. The case also illustrates how an encephalitis may simulate a cerebral abscess.

I have to thank Dr. T. Pierson, medical officer of health for Plymouth, for permission to publish this case. I wish to acknowledge the help I received from the Royal Naval Medical Service, especially from Surgeon Rear-Admiral F. J. D. Twigg and Surgeon Commander T. W. Froggatt who made supplies of penicillin available and gave me much kindly advice, and to thank Surgeon Captain Lambert Rogers and Dr. Golla for permission to include reports from the Burden Neurological Institute.

CAVERNOUS SINUS THROMBOSIS
TREATED WITH HEPARIN AND SULPHATHIAZOLE

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SINCE Seydell's report in 1939 of a recovery from thrombosis of the cavernous sinus after sulphanilamide treatment, many others have been recorded (Morrison and Schindler 1940, Skemp et al. 1941, Eichorn 1941, Wolfe and Wolfe 1941)—some in conjunction with heparin (Lyons 1941, Schall 1941). In the following case heparin was used in conjunction with sulphathiazole.

A woman clerk of 37 was admitted to hospital 2 days after the appearance of a pimple over the left upper eyelid, which developed into bilateral orbital œdema. Temperature 103·5° F., pulse-rate 120, and respirations 30 per min. The lymph-glands on the left side of the neck were enlarged; headache was slight; no signs of meningism; no ocular palsy. A diagnosis of thrombosis of the cavernous sinus was based on the bilateral orbital cellulitis consequent on a unilateral palpebral lesion. Treatment consisted of 42 grammes of sulphathiazole given at the rate of 1 g. by mouth 4-hourly, with 1 g. of sulphapyridine soluble t.d.s. intramuscularly for 3 days. Heparin was given in an intravenous glucose-saline drip, hourly at first and continuously from the second day onward. In all 120,000 units were given over 5 days; the clotting-time during this period was 16–30 minutes.

The day after admission infra-orbital discoloration appeared [illegible] sides, and 4 days later the temperature became [illegible] A culture from the lesion showed a pure growth of hæmolytic streptococci. Blood-count: red
per c.mm.; Hb 61%; CI 0·64; white cells
polymorphs 53·1%, lymphocytes 43·1%, mon
eosinophils 1·1%, myelocytes 2·1%). From
onward the temperature remained normal
subsided completely on the right side, and
lesion soon showed a similar, though
This enabled us to examine the ocular m
greater satisfaction. These, together with
normal. She was discharged on the 23rd
residual incrustations over the left eyelid,
take long to flake off. When seen again, 5
she was in good health except for occasional
aches over the vault, which had arisen
Neither visual nor oculomotor disturbances
The palpebral discoloration had disappeared

The continuous intravenous infusion
found to be more economical than
Upon withdrawal of the drip the blood-c
returned to normal within half an hour (
by the capillary tube method); heparin
eliminated rapidly from the body.

I am indebted for permission to publish
G. H. Steele, FRCS, under whom the patient
My thanks are also due to Dr. S. Keys for
findings.

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ABDOMINAL TOPOGRA
CLINICAL ASPECTS

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THE medical student, beginning to study
of the abdomen, is perplexed to find
abdominal disorders may not only give rise
types of pain in different sites, but that
unanimity as to these sites. For example,
all the standard textbooks he learns that
obstructive appendicitis may first be felt in
trium or the umbilical region or in both.
often stated that biliary colic may be lo
of these regions or in both. In point of fact
pain element (or component) in each of
tions is felt in the midline of the abdomen
site which is constant for each and every
from appendicular or biliary colic.

The ambiguity of pain localisation
present system of anatomical division of
into regions, following the method of
(1893) (fig. 1). To illustrate an extreme

A man aged 42 was admitted to the ward
appendix abscess in the right lower abdomen
appendicitis with perforation. He had a t
colicky midline pain at the onset of his illness,
midway between the xiphisternum and the
On dividing his abdomen into the custo
zones by the subcostal and intertubercular
that the patient had no umbilical zone. His
be described as being felt in the epigast
gastrium (fig. 2). This man had no deformity
ribs or pelvis.

On May 23, 1892, William Anderson
Anatomical Society a paper entitled "A
formity in the Delimitation of the Regio
men." There were at that time 14
delimitation into the nine historical
abdomen, and it was Anderson's plea
appointment of a committee of the
to try to get uniformity. In his ad

the subdivision into nine segments iscuss the method of delimitation izontal planes, the most ancient he best is that quoted in Le Clerc's (published in English 1696) subdivided into three equal parts izontal line lies at the junction of third, the inferior at the junction dle thirds.'

ever, Cunningham's suggestion (1895) to modify "subcostal" and replace the "interiliac" by ubercular plane was accepted, and his is now ard method. In 2 (one male and one female) jects examined by Cunningham, the subcostal and interiliac lines coincided, while in the distance separating these planes varied from 2½ inches. It was to make the umbilical zone t he replaced the interiliac plane by the ercular. Using this method he found that in jects the breadths of the resulting umbilical ied from 1½ to 4 inches, while the costal and c zones, as measured along the middle line averaged 6 and 5 in.

PRESENT INVESTIGATION

vestigate further the relationship which the zone bears to the distance from the apex of sternal notch (lower border of the gladiolus rnum) to the upper surface of the pubic sym- the abdomens of the first hundred patients to the wards were measured. Three classes en—(a) males aged 14–80 years, (b) females –80 years, and (c) children aged 2–14 years. Class further divided into those aged 2–4, 5–9 and years. All patients were normal in that there was mity of the spine, ribs or pelvis. Measurements made with the patient lying on his or her back on surface, the position that a patient being examined intra-abdominal complaint usually adopts.

ON AT DIFFERENT AGES BETWEEN DEPTH OF UM ICAL ZONE (U) AND DISTANCE FROM XIPHISTERNAL TCH TO SYMPHYSIS PUBIS (L)

(yrs)		2–4	5–9	10–14	15–20	21–30	31–40	41–50	51–60	61–70	71–80
	M	1/3	1	1/	1	1/6	1/6	1/7	1/7	1/7	[illegible]
	F				[illegible]	1/6	1/6	1/7	1/7	1/8	1/8

will be seen from the table that as age advances is progressive narrowing of the vertical width of umbilical zone (fig. 3). This is especially well in patients of hyposthenic build. Sthenic tend to retain the wide umbilical zone forming a third of the distance from xiphisternum to symphysi pubis, as seen in children from the ages of 2 to 5 years.

To attempt to ascribe a definite locality to a centra abdominal pain is obviously impossible using the standard topography. A scheme in which the width of the umbilical (and costal) zone depends on such a variable factor as the obliquity (slope, as Cunningham termed it) and length of the ribs is of little value in determining the position of the abdominal viscera, or in localising pain produced in, or indirectly by, these viscera. It is strange that it has been so long retained. The

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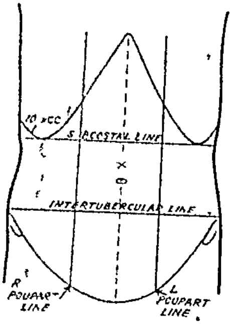

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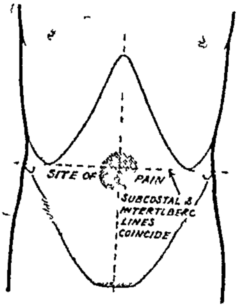

2

Fig 1—Cunningham's method of abdominal topography. The disadvantage of using this method is illustrated in figs 2, 3 and 4. Compare with fig 5.

Fig 2—Abdominal topography of man of 42 suffering from acute appendicular colic in the shaded area. With Cunningham's method there is no umbilical zone; the pain therefore is situated in the epigastrium and hypogastrium. The umbilicus is in the hypogastrium.

kidney is thus obtained

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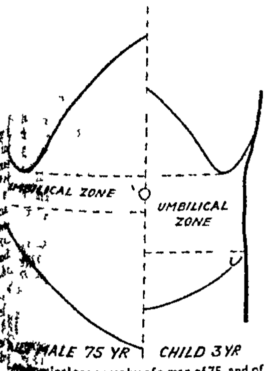

inal topography of a man of 75 and of a child of 3 years showing sizes of the umbilical zones—wide in the child and narrow in age

aged 58. The subcostal and intertubercular lines (of Cunningham) by half an inch. There is no umbilical region, no lumbar region, no umbilicus is wholly in the epigastrium and half in the hypogastrium

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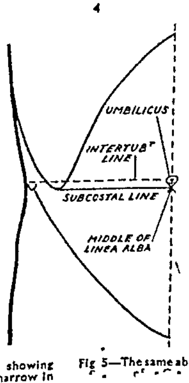

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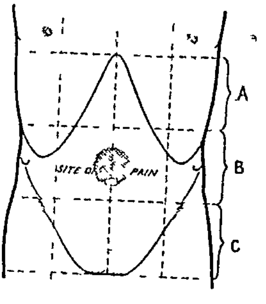

Fig 5—The same abdomen as in Fig 2 now divided into regions using the modi

height of the iliac bones seem to be less variable than the length and slope of the ribs.

To state without qualification, as is often done, that the pain of an abdominal disorder is felt around (or above, or below) the umbilicus conveys no reliable information as to the exact position of the pain, and attempts to regionalise the umbilicus and midpoint of the linea alba, or to correlate these two landmarks with Cunningham's three zones, simply make confusion more confounded. Whichever topographical scheme is adopted the position of the umbilicus must be completely ignored.

In our series the following facts emerge (using Cunningham's topography)—

Regional position of midpoint of linea alba.—This was high in the umbilical area in fully half the cases; in the centre of the umbilical area in 21; below the centre in 9; it was in the epigastrium in 4; on the subcostal line in 7; on the intertubercular line in 1; and in the hypogastrium in 2.

Position of umbilicus relative to centre of linea alba.—In the great majority the umbilicus was below the centre of linea alba. In 8 cases the umbilicus and centre point coincided; in 4 cases the umbilicus lay above the centre point.

Regional position of umbilicus.—Low in the umbilical area in about two-thirds of the cases; middle of the umbilical area in 14, and high in umbilical area in 3; in the epigastrium in 1; on the intertubercular line in 9; in the hypogastrium in 3.

Comparative widths of three zones (as measured along the linea alba).—All three were equal in only one case, a woman aged 38 of sthenic build. The costal zone was the widest in 46; the umbilical zone the widest in 3 (children of 2 years); and the hypogastric zone the widest in 14 (3 males and 11 females).

The costal zone was the narrowest in none; the umbilical zone was the narrowest in 63; and the hypogastric zone the narrowest in 5 (3 children of 2 years, 1 of 8 years and a man of 58).

The costal and hypogastric zones were of equal width in 19; the umbilical and hypogastric zones were of equal width in 1 (a man of 40).

The costal zone was as wide as, or wider than, umbilical and hypogastric zones together in 9 cases. The hypogastric zone was as wide as, or wider than, costal and umbilical zones together in 2; in both cases the umbilicus was in the hypogastrium.

The umbilical zone occupied a third of the abdomen in 4 (3 children of 2 years and 1 woman of 38). There was no umbilical zone in 2 patients. In the man of 42 already referred to the subcostal and intertubercular planes coincided (fig. 2). In a male aged 58 years these two planes overlapped by half an inch (fig. 4). In the man of 42 the hypogastrium was not as wide as the epigastrium but contained the umbilicus. In the man of 58 the epigastrium was the narrower and the umbilicus was on the intertubercular plane *above* the subcostal plane and above the midpoint of the linea alba (on the subcostal plane). The umbilicus, therefore, was wholly in the epigastrium and half in the hypogastrium.

Recently we had in the wards at the same time three patients suffering from acute appendicitis. All had had central visceral pain at the onset of the illness. This pain was in exactly the same position in all, but in a different region in each.

A young child suffering from appendicular or small-intestine colic has his pain in the umbilical region, for the simple reason that he has a relatively wide umbilical region (fig. 3). The same patient, as an adult, with the same complaint may have his pain in any one of the three central regions, in any two, or in all three. It mainly depends on the adult length and slope of his ribs, and yet the patient will maintain, rightly, that his attacks of pain have always been felt in the same position.

Renal pain is usually described as being localised in the lumbar region or in the loin. If the term "lumbar region" is used in the topographical sense, it is obvious from our investigation that such a description must in many cases be inaccurate, since a considerable percentage of people have a very narrow umbilical zone (which includes the lumbar region), and some have no umbilical zone. This difficulty may be avoided by stating that renal pain is felt in the loin, but that also is not an accurate or desirable description because the loin has not easily identifiable boundaries, and because in some cases the last rib and iliac crest overlap. Where the subcostal and intertubercular planes coincide, an a
tion of renal pain would run somewhat
pain was situated in the right hypochon
iliac regions because the patient has no
region because the subcostal and intertu
coincide because the ribs are longer and
than is usual, and because the costal
zones are of equal width." Not a desira
description, but how can it be avoided wit
scheme of topography?

SUGGESTED DIVISION OF THE AB

It is necessary for the teaching of anato
to have a rational and convenient method
the abdomen into regions; and above a
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t [illegible] be retained as they
end for descriptive purposes. To provid
dividing the abdomen into regions to whi
visceral type particularly may be at
exactly, the length of the linea alba sh
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suggested by Le Clerc in his Epitome of
three zones thus defined should be furt
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pendicular lines reared from the
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and pancreatic ducts—would always b
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pain from mid-gut derivatives, for exampl
would always be felt in the middle t
region), and pain from the hind-gut d
colon, in the lower third (the hypoga

The obvious advantage of this schem
Cunningham is that it ensures that eve
retain the well-proportioned umbilical zo
irrespective of the length and slope of hi
height of his iliac crests.

The ambiguous and indefinite description
current in medical literature and in clinical
ing the localisation of abdominal pain
avoided and replaced by clear and exa
For example, using the suggested meth
state that acute appendicular colic is
in the umbilical region, whereas in chron
pain may be present in the epigastrium
case the central visceral pain is produced
by hypercontraction of its muscular wa
jected to the primary relative position of
i.e., the umbilical region. In the chron
gastric pain is not produced in the ap
reflex pylorospasm—the ileo-gastric syn
waite 1942)—and hence the difference
The later local pain of acute appendicitis
right iliac fossa, is a somatic pain due i
to chemical irritation of the adjacent
toneum. Thus we can state, as a gener
visceral pain it is the early embryological
viscera we must bear in mind, while in s
the permanent position of the viscera whi
In other words, visceral pain tells us wh
gut is at fault, and somatic pain tells us
the lesion is to be found.

A clear conception of how these two
are produced and what they signify a
the study of abdominal pain, and is
accurate and logical diagnoses. In spite
of Hurst (1911), Morley (1931) and oth
that one meets a practitioner who is r
in the study of abdominal pain; hence
high mortality, due to late diagnosis, in
disorders.

SUMMARY

The standard system of anatomical
abdomen into regions is of little value in c
for it is based on landmarks whose posit
age, build, degree of kyphosis, &c.

It is suggested that the present system
a modification of Le Clerc's system. T

o thirds by horizontal lines, and two per- lines are [illegible] at the midpoints of the aments.

[illegible] of abdominal topography the exact [illegible] can be definitely and accurately [illegible] ambiguous terms which can be under[illegible]

[illegible] Prof J C Brash anatomical part [illegible] University for a helpful personal com[illegible]

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E R (1912) [illegible] Surg 30 [illegible]
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D J (1919) [illegible]
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THE
GOCOCCAL-ADRENAL SYNDROME
VE CASES WITH ONE RECOVERY

NALD HOLMES J MACFARLANE COWAN
OS, M R C P M B GLASG
ICIANS, STAFFOR [illegible] GENERAL INFIRMARY

ical concept of meningococcal infection has been dominated by meningitis its commonest ion, but in recent years there has been an the recognition of meningococcal septicaemia eningitis. There is an extensive literature o the chronic type of meningococcal septic acterised by intermittent pyrexia petechial lopapular skin eruptions and sometimes ions resembling erythema nodosum (Apple 7, [illegible] Stott and Copeman 1940 et al 1941, Copeman 1942) The acute g type of septicaemia with adrenal haemorrhage h we are concerned in this paper, is still s comparatively rare and not more than 4 cases have been recorded (Banks and 1943) Since death usually occurs in a matter may not be recognised as frequently as it outside fever hospitals or other large centres occal infections may now be classified in the main groups, all of which should be easy to the characteristic clinical pictures be borne rries 1942, Banks and McCartney 1943)

ccal septicaemia (a) Acute fulminating septic- with extensive purpuric eruptions and adrenal hages, death often occurring from circulatory in a few hours from the onset (b) Chronic mia, with intermittent pyrexia, petechiae and skin resembling erythema nodosum occasionally [illegible] of meningitis [illegible] chronic These cases [illegible] nosis [illegible] of meningitis must have some degree of intracerebral lesions Deep coma may be [illegible] tis may be masked [illegible] ten accompanies the aracteristic purpuric [illegible] in both Banks and [illegible] demic times at least, [illegible] ome a pure adrenal [illegible] cephalitic adrenal syndrome, [illegible] ide nasopharyngitis, septic

[illegible] syndrome, with which we are mainly is often called the Waterhouse-Friderichsen but there is little justification for retaining on historical grounds, and even less as a term The 'meningococcal adrenal syn' seems to us a concise and adequate name for [illegible]

al picture of the pure adrenal syndrome is [illegible] recognised cannot be forgotten [illegible] of a fulminating septicaemia, [illegible] resembling the "heliotrope [illegible] n described in connexion with [illegible] Later multiple cutaneous petechiae and possibly massive purpuric haemorrhages appear The pulse is rapid, of poor volume, and may be almost imperceptible The blood-pressure is very low Respiration is rapid and shallow, and may become Cheyne-Stokes in type Consciousness may remain clear until the end, but as in cases 2 and 3 it may be slightly dulled Death usually occurs within 24 hours of the onset in untreated cases The difficulty in this type of case is in making a diagnosis and beginning treatment at the earliest possible moment There is usually no time for laboratory investigation and the diagnosis must be made on clinical grounds alone

When the adrenal syndrome occurs in cases with the presenting signs of meningitis or meningo-encephalitis it may be overlooked, but the above mentioned clinical picture is present in variable degree We would advocate that frequent blood pressure readings be taken in all cases of severe meningococcal meningitis, since an abnormally low blood pressure is the only reliable early sign of adrenal failure If treatment be withheld until the characteristic cyanosis and rapid shallow respiration appear it may be too late to be effective Recoveries from apparent adrenal lesions have been reported by Harries (1940) in three cases, Crov (1940) one case and Banks and McCartney (1943) three cases

Biochemical investigations in such cases have been scanty There is naturally little time for extensive investigation of the blood chemistry Magnusson (1934) found hypoglycaemia in four fatal cases and a non-protein nitrogen of 105 mg % in one He also quotes another case of Bamatter's in which the blood-sugar was normal but the non-protein nitrogen was 131 mg % In this case also the serum sodium was raised (035 mg %) and the serum potassium was normal (21 mg %) Banks and McCartney in one patient who recovered found a diminished alkali reserve and an increased blood-urea

CASE-REPORTS

The first three cases are remarkable in that they arose in the same family, consisting of husband, wife, and six children, and all ended fatally within four days. On the day that the first case occurred a child in a neighbouring house had died within a few hours of "purpura fulminans" but no details of this are available A woman who had been in intimate contact with all four children was found to have type II meningococci in her nasopharynx and type II meningococci were also isolated from cases 1 and 3 No other carrier was found in either household and no other cases of meningococcal infection had been reported in the neighbourhood It is almost certain that the death from "purpura fulminans" was due to the meningococcal adrenal syndrome

CASE 1.—Male, aged 4 years Admitted under J MacD H. on Dec 7, 1943 Sudden onset of headache, vomiting, and a blotchy erythematous rash the previous evening By the morning of Dec 7 the rash had become deep purple and the patient was semistuporose Definite signs of meningitis were present on admission and there was a petechial and massive purpuric rash over the whole body, most evident on the arms and legs T 102 2° F, P 148, R 40, deep and stertorous Lumbar puncture gave a slightly turbid fluid [illegible] pressure 300 mm cells 600 per c mm [illegible] 620 mg % Many extra- and [illegible] diplococci were seen in the stai [illegible] type II meningococci Soluble sulphapyridine 1 g was given intravenously in 20 c cm of normal saline and 3 g of sulpha- [illegible] mouth every four hours [illegible] temperature normal, [illegible]

Dec 9 still stup [illegible] pyrexia or purpura, but cyanosis present and respiration rapid and shallow Pulse rate 140 BP 85/70 mm Hg Rectal salines and 10 mg of desoxycortone acetate given intramuscularly

Dec 10 no improvement Pulse imperceptible Some of the purpuric patches necrotic Further 20 mg of desoxycortone given and more saline Death early in morning of Dec 11

Necropsy.—Intense lividity Thymus present, weight 14 g Lungs very congested and oedematous No petechiae on pleura or pericardium Gross enlargement of mediastinal lymph glands, which are livid in colour Mesenteric glands also enlarged and livid Small amount of free fluid in peritoneal cavity Spleen normal in size, soft, weight 45 g.

Retroperitoneal tissues intensely œdematous, particularly around kidneys. Both adrenals show focal hæmorrhages, with intervening areas of normal appearance. Brain intensely swollen and congested. Thrombosis of superior longitudinal sinus present and cortical veins very distended. Moderate amount of yellow purulent exudate in sulci.

Sections.—Adrenals show areas of recent hæmorrhage which have infiltrated the cortex and medulla without entirely destroying the structural outline. Brain shows a moderate degree of perivascular lymphocytic cuffing. Hyaline thrombi seen in small vessels. Thymus shows no histological abnormality.

CASE 2.—Female, aged 8 years, sister of the above. Admitted under J. M. C. on Dec. 8, 1943. Seen at home shortly before admission. Persistent vomiting and slight headache had begun 4 hours before; 2 hours later a widespread petechial rash, macular in places, developed. Mentally the child was slightly disorientated but could answer questions distinctly. No neck-rigidity. On admission to hospital the child had become comatose and the pulse was almost imperceptible. T 103° F, R 40. Pulse-rate and BP not obtained. Soluble sulphapyridine 1 g. given intramuscularly. CSF not under increased pressure, cells 1 per c.mm., protein 30 mg.%. chlorides 630 mg.%. No organisms seen in smears. Culture sterile. Died 3 hours after admission.

Necropsy.—Intense lividity. Generalised petechial and patchy purpuric rash, most marked on face, shoulders, abdomen, and legs. Thymus enlarged, weight 41 g. Œdema of mediastinum, with enlargement of tracheobronchial and cervical glands, some of which are livid on section. Lungs congested and grossly œdematous. Small amount of fluid in left pleural cavity. Heart: some ante-mortem clot in left ventricle; a few pericardial petechiæ and early pericarditis at base. Gross enlargement of mesenteric lymph-glands with hæmorrhage into some. Œdema of mesentery and retroperitoneal tissues, especially around kidneys. Bilateral suprarenal hæmorrhages with complete destruction of medulla of both glands, but no rupture of capsules. Spleen enlarged and congested, weight 177 g. Brain congested, but no other macroscopic abnormality seen.

Sections.—Adrenals show recent substantial hæmorrhage almost entirely replacing the medulla of both glands. Cerebral cortex shows no evidence of encephalitis. A mesenteric lymph-gland shows recent hæmorrhage. Thymus appears normal

CASE 3.—Female, aged 15 years. Sister of the above two. Admitted under J. M. C. on Dec. 10, 1943, about ½ hr. after onset of vomiting and pyrexia. On admission T 102·8° F, P 140, R 40. Dusky cyanosis present. BP 90/70 mm. Hg. Slightly drowsy, but completely conscious, with no signs of meningitis. Blood was taken for culture and later type II meningococci were recovered. Soluble sulphapyridine 1 g. given intramuscularly every 4 hours, with 10 mg. of desoxycortone acetate. Plentiful glucose drinks containing sodium chloride and sodium bicarbonate also given and rectal salines. By the evening a profuse purpura had developed and the cyanosis was more pronounced. No improvement occurred and the child died 20 hr. after the onset, retaining consciousness almost to the end.

Necropsy.—Generalised intense lividity, with numerous small purpuric hæmorrhages. Thymus enlarged, weight 25 g. Lungs congested and œdematous. Small amount of fluid in left pleural cavity and a few pleural petechiæ. Numerous pericardial petechiæ. No gross enlargement of mediastinal or mesenteric lymph-glands. Retroperitoneal tissues very œdematous. A few petechiæ on mesentery and serous surface of intestines. Both adrenals replaced by massive hæmorrhages, but no rupture of capsules. Spleen slightly enlarged, weight 115 g. Brain œdematous and congested, but no evidence of meningitis.

Sections.—Both adrenals show massive recent hæmorrhages. Brain: a hyaline thrombus seen in one vessel. Spleen congested, many polymorphs seen in pulp. Thymus: no abnormality seen.

CASE 4.—(We are indebted to Dr. J. Sowerbutts and Dr. A. J. Rhodes for the report of this case.) Male, aged 3½ years, an inmate of a children's home, was noticed to be slightly irritable on the night of Dec. 18, 1943. At midnight he soiled his bed and was seen by a nurse, who noticed no other abnormality. At 6 AM next morning he was found dead and with a generalised purpuric rash. Dr. Sowerbutts mentioned the case to one of us on the telephone, who suggested a diagnosis of meningococcal-adrenal syndrome. A post-mortem examination was carried out the same morning by Dr. A. J. Rhodes, who has kindly given the following details.

Necropsy.—Well-marked lividity. Profuse petechial and in parts purpuric-hæmorrhagic rash over limbs and trunk. Blisters on front of right shin. Moist area on dorsum of left foot where it had been denuded of epithelium. Numerous petechial hæmorrhages under serous coat of intestines, in mesentery, mediastinum, pericardium and pleuræ. Heart and lungs normal. Adrenals: well-marked hæmorrhages completely destroying normal architecture. Brain markedly congested with flattened convolutions. CSF turbid. Dr. Rhodes concluded, from the absence of any primary focus of infection, that death was due to fulminating meningococcal septicæmia with adrenal hæmorrhages. No attempt to isolate the meningococcus was made because the body was cold.

This case occurred in a town 12 miles away from the others and no contact between them could be traced. Nasopharyngeal swabs taken from 9 staff and 31 inmates of the children's home revealed no meningococci, but prophylactic sulphapyridine had been given to everyone during the previous 24 hours.

CASE 5.—Female, aged 21 years. Admitted under J. MacD. H. on Dec. 24, 1943, with severe meningitic symptoms. Very restless and irritable, but conscious. Slightly cyanosed, but, apart from a few rose-coloured spots which faded on pressure, no rash. Two large blisters on dorsum of left foot. T 101° F, P 140, R 26, BP 90/80. Illness had begun early the previous day with vomiting and a rigor. Later that day intense headache and cerebral irritation developed. CSF pressure 300 mm., fluid very purulent. Gram-negative diplococci found in smear. Soluble sulphapyridine 2 g. given intravenously and followed by 2 g. of sulphathiazole every 4 hours by mouth. Blood-urea 63 mg.%; blood-sugar 0·082%; serum-potassium 39·2 mg.%; serum-sodium 407 mg.%.

Dec. 25: T 100° F, P 124, R 38. Much less irritable, but confused. Cyanosis has increased. BP 90/80. Desoxycortone acetate 40 mg. given intramuscularly, and intravenous drip of 10% glucose-saline begun.

Dec. 26: T 100·5° F, P 110, R 32, BP 98/85. Further 10 mg. of desoxycortone given intramuscularly. Three litres of glucose-saline given intravenously in past 36 hours.

Dec. 27: T 97° F, P 88, R 22, BP 120/80. Slight generalised œdema, probably due to saline infusion and desoxycortone. Urinary output normal. No albuminuria. Mental condition normal, but still has slight neck-rigidity and headache. Sulphathiazole stopped. Total dosage of sulphonamides 13 g.

Dec. 28: T 98° F, P 76, R 20, BP 125/65. No headache. Blood-urea 27 mg.%; serum-potassium 13·6 mg.%; serum-sodium 343 mg.%; blood-sugar 0·112%. Further progress was uneventful. Intravenous glucose-tolerance test done on Jan. 1, 1944, gave the following normal result—fasting blood-sugar 0·118%; 20 g. of glucose given intravenously; blood-sugar after ½ hour 0·200%, after 1 hour 0·123%, after 1½ hours 0·118%, and after 2 hours 0·108%.

This patient was assumed to have adrenal lesions in view of the lowered blood-pressure, low blood-sugar, raised respiration-rate and cyanosis, but it must be admitted that the signs of the adrenal syndrome were not pronounced. The only definite cutaneous lesions were the blisters on the left foot and a few rose spots. Some of the cyanosis may have been due to the sulphathiazole, but it was present before this was given and was more pronounced than is usual in sulphonamide therapy of similar dosage. Culture of the blood and cerebrospinal fluid was not attempted. There was no traceable contact with the other cases.

DISCUSSION

The various acute manifestations of meningococcal infection are well illustrated by these five cases. Case 1 is an example of the mixed meningoencephalitic adrenal syndrome. Cases 2, 3 and 4 are probably all the pure adrenal syndrome, or with only slight cerebral lesions. In case 5 the adrenal lesion is hypothetical, but the meningitis and septicæmic symptoms were very pronounced.

It is not clear what factors are responsible for the adrenal syndrome. In the present series there was no epidemic of meningococcal infection in the district, although a few mild sporadic cases had occurred. The incidence of the adrenal syndrome is therefore high. In a small epidemic of 23 cases in this district in 1940 there was only one case with the clinical features of the adrenal syndrome It has been suggested that the acute fulminating septicæmic cases occur early in an epidemic before any herd immunity has developed The prophy

loses of sulphapyridine to
ises may have prevented

The post mortem findings in many of the recorded cases suggest that death is due to circulatory collapse from a severe diminution in blood volume Three of our fatal cases showed widespread œdema of the lungs and interstitial tissues This was also noted in 3 cases by Morison (1943) In case 5 œdema did in fact appear, but it was attributed to the large volume of saline infused and the desoxycortone The chemical findings in case 5 are difficult to interpret, but may be due to dehydration in a stuporose patient with a high pyrexia Another feature present in 2 of our cases was enlargement of the thymus and lymphatic glands This was not due to the associated œdema It was first mentioned by Rabinowitz (1923), again by Magnusson (1931), and was also noticed by Morison in his 3 cas In view of the short duration of the illness and the apparently normal histological appearance of the thymus and lymphatic glands the enlargement must have been pre-existing It is possible that the meningococcal adrenal syndrome occurs only in individuals with an inherent structural and functional deviation from normal in their thymo lymphatic system and adrenal glands This suggestion has little to support it as yet but the presence of thymolymphatic enlargement in some of the more carefully recorded cases appears to be more than coincidence and worthy of detailed investigation Much remains to be determined about the blood chemistry and hæmodynamics of the condition It is doubtful whether the severe septicæmia or the adrenal lesions in themselves are entirely responsible for the rapidly fatal progress of these cases

It is clear from the study of this series of cases and others that the successful treatment of the fulminating type of meningococcal septicæmia with adrenal lesions is impossible unless vigorous measures be taken to combat the circulatory failure The sulphonamide drugs alone appear to be useless The meningococci isolated from our cases were found to be non resistant to sulphonamides in laboratory cultures, but in case 3, although sulphapyridine was given within half an hour of the onset of symptoms and 8 hours before the development of purpura, it had no effect on the rapid progress of the illness In the few recorded instances of successful treatment of the condition the sulphonamide therapy has been supplemented by 1
saline or glucose-saline and
extract or desoxycortone
circulatory collapse be a reduction in blood-volume it would be reasonable to use plasma-transfusion rather than glucose saline

SUMMARY

Five cases of the meningococcal adrenal syndrome are described, four fatal and one which recovered, the diagnosis being presumed

In three of the fatal cases gross œdema of the interstitial tissues was found This lends support to the view that death is in large measure due to circulatory collapse from severe diminution in blood-volume

In two of the fatal cases thymolymphatic enlargement was found, and it is suggested that this may be a factor in determining the susceptibility of the adrenals to the infection

We are grateful to Dr J L Edwards for the bacteriological and histological examinations

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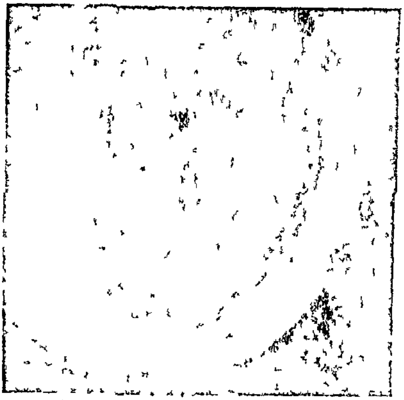
URETERIC CALCULUS

TREATED BY REVERSED CATHETERISATION

R O PERCIVAL FRCS, MRCOG
SURGEON LIEUT COMMANDER, RNVR
From one of HM Hospital Ships

THE ureteric calculus recently impacted and showing no sign of progress under observation is not a rarity Several procedures have been described for dealing with such cases, but often the special instrument required is not available or the method advised is unsuccessful Such procedures are the passage of ureteric dilators, spiral dislodgers, balloons, and bougies, the retrograde injection of lubricants, and the use of various ureteric stimulant and antispasmodic drugs

Each of these methods has been successful in some cases, but no one method is sufficiently reliable to merit use as a routine On a tropical station particularly where such cases are likely to be met relatively often, it is desirable both from the patient's and "Service" aspect to treat them by instrumental methods rather than by open operation All cases which have had uretero lithotomy performed on this station have been invalided for service in a cool climate The purpose of this paper, therefore, is to draw attention to a useful yet simple method of dealing with the small recently impacted ureteric calculus


Reversed catheter engaging a small recently impacted ureteric calculus

The method, of which the one to be outlined is only a slight modification, was first described by Finney[1] of South Carolina, who found it successful in 49 out of 50 cases In no case did appreciable trauma or reaction occur Apart from an annotation in THE LANCET (1942, i, 298), I have seen no reference to Finney's original article, nor have I met anyone who has either known or confirmed the efficacy of the method

My experience amounts to three cases only, two of which were entirely successful, while the third showed promise of a good ultimate result when the patient was transferred owing to Service reasons Nevertheless, its simplicity and safety, and the excellent report of its originator, seem to offset the lack of a larger series

The method is as follows A long piece of fine silk is passed through the tip of a no 6 X ray catheter and tied, the knot being as small as possible The silk passes along the outside of the catheter and then enters the lumen via a
15 cm mark I
through the ren
to the stilette,
original description the silk remained external to the catheter throughout its length, but I have found that the silk becomes taut and somewhat hindered in its passage up the ureter owing to frictional drag on the

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[1] Finney R P J Amer med Ass 1941, 117, 2129

silk in the catheter channel of the cystoscope. Also, acting like the string of a bow, it tends to cause some trauma to the ureteric orifice (and no doubt to the ureter higher up) on traction. Moreover, traction made the unprotected silk produce penile pain by cutting into the urethral mucosa. Both disadvantages are easily overcome by passing the thread along the lumen of the catheter. The stilette is reintroduced fully before use. Cystoscopy is now performed and the catheter passed up the ureter. If there is difficulty in passing beyond the stone, and this is likely to be the chief obstacle, success has been achieved by withdrawing the stilette and injecting saline at the same time as the catheter is gently pushed upwards. The stilette is again introduced. When the catheter has reached the kidney pelvis the stilette is withdrawn for 2–3 inches, and a loop formed by pulling on the silk and pushing the catheter further up. The tip of the catheter is thus made to re-enter the ureter and begin a reversed course. The stilette is now removed and the silk and catheter together gently drawn down until the resistance of the calculus is met. An X ray is taken at this stage to confirm the relation of the reversed catheter with the stone, which may be engaged by the tip of the catheter or ensnared in the loop, the latter being the more satisfactory. The cystoscope is now removed and the patient returned to bed. A small traction-scale is attached to the silk and instructions left for a pull of 2 lb. to be applied for a short time every 2–3 hours. At the end of 24 hours the patient is given a short anæsthetic (gas and oxygen) in his bed, and a pull of 5 lb. is applied by the surgeon himself. Should this prove unsuccessful the procedure is repeated for a further 24 hours. If the calculus has not been dislodged at the end of this period further traction is inadvisable, and the catheter should be removed unless open operation is contemplated forthwith. Removal is achieved by releasing the silk and pulling on the catheter. In Finney's series of 50 cases, only one open operation was necessary.

CASE-RECORD

A petty officer, aged 38, was admitted on July 6, 1943, complaining of sudden sharp colicky pain in the left iliac fossa, radiating to the tip of the penis. There was slight frequency but no pain on micturition or hæmaturia. He had had a similar pain in the left loin a week before, lasting only a few hours. Physical examination revealed no abnormal signs, but the urine contained pus and red blood-cells and calcium oxalate crystals. X ray revealed a small rounded irregular opacity near the tip of the left ischial spine, which intravenous pyelography showed to be in the line of the lower end of the ureter. There was also slight dilatation of the ureter throughout its length.

On the 10th, at cystoscopy, there were slight œdema and petechiæ around the left ureteric orifice (LUO). Chromoscopy was normal on both sides except that the left showed a much less forceful efflux than the right. A no. 6 ureteric catheter was then passed up the left ureter and met initial obstruction at 5 cm. This was passed and 5 c.cm. of sterile liquid paraffin injected above and below the stone. The patient had no symptoms over the next six days and X ray showed no change in the position of the calculus.

On the 16th cystoscopy was again performed and a no. 6 X-ray catheter, with silk ligature attached, was passed up to the kidney pelvis, reversed, and gently drawn down until obstruction was met (see figure). Gentle traction now caused the efflux of debris from the LUO and produced a slight increase in its surrounding swelling, with some pain in the left iliac fossa. The patient was returned to bed and intermittent traction applied over the next 48 hours. He had no discomfort beyond aching in the left iliac fossa during actual traction, and voided urine normally. At the end of this period he was again cystoscoped in order to watch the LUO during withdrawal of the calculus (this procedure is unnecessary normally). Steady 5 lb. traction was applied and after about 10 seconds the calculus, surrounded by much debris, emerged from the LUO, followed by the catheter and silk. X ray now showed the calculus lying in the bladder and the ureter clear.

On returning to the ward the patient passed the calculus in the first specimen of urine voided. It was grey with a finely irregular crystalline surface, and measured 1 × 0·5 cm. There was neither pain nor hæmaturia after this procedure. Further cystoscopy on July 26 showed a rather patulous LUO but no œdema and a normal efflux. A ureteric catheter passed without obstruction to the kidney pelvis but retrograde pyelography showed slight dilatation still of the left ureter, with a small pocket at its lower end. The urine became clear of pus cells on Aug. 2, and he was discharged to duty on Aug. 5.

DISCUSSION

The advantages of this method are obvious—it is simple, effective, and as shown by Finney in his 50 cases has low risk to the patient. If the operation is successful the patient is soon fit to return to duty. If it fails, uretero-lithotomy may still [illegible] the usual way, but as a rule invaliding [illegible] is necessary later. In the case here described lithotomy would have been indicated if reversed catheterisation had failed, for there was beginning dilatation and infection of the urinary tract with no progress of the calculus, which later pyelography showed to be lodged in a small pocket.

The chief difficulty to be overcome in most instrumental methods is in manipulating the instrument past the stone. If this is not possible the method usually fails. In using the catheter as a lithotrite, saline can be injected while manipulations a[illegible] is thereby facilitated. The small stone offering complete obstruction to a catheter is likely to be passed spontaneously, while the one that allows the catheter to pass probably lies partially in a pocket and stands a high risk of remaining there. The size of the stone would naturally influence the type of treatment adopted, and in the cases treated personally the stones have exceeded 1 cm. in diameter. Finney, pointing out the dangers of applying too much traction, emphasises that *in no case should an attempt be made to extract the stone immediately.* His method is essentially one of gradual dilatation and is based on experimental work carried out on large dogs. He found that in every case a ureter would stand a pull of 5 lb. but none would stand 10 lb. Trauma to the mucosa was found to be minimal both experimentally and clinically. There is no tendency for the catheter loop to obstruct the ureter—in fact it aids drainage, since urine will pass alongside it and escape, as the absence of pain after catheterisation demonstrates.

If the method fails and there is difficulty in removing the catheter (this never happened in the cases reported) no harm is done; in fact Finney suggests that it is probably better to leave the catheter in place before proceeding to open operation. Traction on the catheter by an assistant during the operation will then simplify identification of the ureter and calculus.

SUMMARY

Attention is drawn to a simple and effective method of extracting a small recently impacted ureteric calculus.

The principle of the method is gradual ureteric dilatation through intermittent traction on a ureteric catheter made to form a loop which grips the stone.

In 50 cases reported elsewhere by Finney, no complication of any kind was encountered.

One of three personal cases illustrating the method is described.

I wish to thank the Medical Director-General of the Navy for permission to publish this article.

WELFARE EQUIPMENT DEVELOPMENT ASSOCIATION.—An association of manufacturers and distributors, under the chairmanship of Mr. Tudor Davies, was set up at a meeting held in London on Dec. 6. The speakers included Dr. R. A. Galway, who suggested many ways in which the association could coördinate the efforts of manufacturers and the needs of welfare officers. The acting hon. secretary of the association is Mr. A. E. Hinds, 61, St. Paul's Churchyard, EC4.

MIDGE CONTROL IN SCOTLAND.—The scientific advisory committee of the Secretary of State for Scotland has appointed a subcommittee under the chairmanship of Brigadier F. A. E. Crew, FRS, to deal with this problem. The members are: Mr. A. E. Cameron, D SC, Mr. J. A. Downes, Mr. Guy Morison, Prof. A. D. Peacock, D SC, and Mr. A. J. Purves (secretary), Department of Health for Scotland, St. Andrew's House, Edinburgh, 1.

Medical Societies

BRITISH ORTHOPÆDIC ASSOCIATION

THE annual meeting of the Association was held in London on Dec. 15 and 16, under the presidency of Mr. ST. J. D. BUXTON. On the second day there was a discussion on amputations and limb-fitting at Queen Mary's Hospital, Roehampton.

VASCULARISATION OF MUSCLES

Prof. W. E. LE GROS CLARK said it is well known that most muscles are supplied by two or more main blood-vessels, and injected specimens show clearly that their branches effect a number of anastomotic connexions inside the muscle. But such material gives no real indication of the adequacy of these connexions for the establishment of a collateral circulation; nor does it tell us whether interruption of one of the main vessels (or of one of their intramuscular branches) may lead to a localised ischæmia severe enough to be of practical importance. These problems have been studied in rabbits by the ligature of blood-vessels supplying muscles, the results being assessed partly by subsequent histological examination, and partly by using a highly diffusible dye, bromo-phenol blue. This dye rapidly colours all normal muscles after intravenous injection, and is of particular value for assessing the physiological efficiency of the circulation, since it indicates the degree of interchange between the capillaries and muscular tissue even when a feeble circulation in the main blood-vessels may, in fact, be still present. The efficiency of the anastomotic connexions was found to vary considerably in different muscles. In some, such as the tibialis anterior, ligature of one of the vessels of supply
d area of ischæmia. For example,
of the lower vessel of supply to
intravenous injection of bromo-
upper half of the muscle to a
the lower half remains almost entirely unstained, and the boundary between the two areas is sharply defined. The normal vascularisation of the lower half of the muscle is not restored for about a week. If both of the
tibialis anterior are ligatured,
for a fortnight. In experim
ball-bearings were shot through the adductor muscles of rabbits at velocities of 250–1000 metres per sec., localised and sharply defined areas of ischæmia were produced, as the result of interruption of the muscular vessels (probably associated with some local vascular spasm). Histological study of the unstained areas of muscle in these experiments showed that most of the muscular tissue had undergone necrosis. The necrotic tissue is removed remarkably quickly by the invasion of granulation tissue with abundant macrophages, and its removal is soon followed by the regeneration of new muscle-fibres. In this way, a large part of the damaged muscle appears to become reconstituted. More experimental work is required to determine whether this regeneration is more than a temporary phenomenon, and whether it leads to the formation of functional muscular tissue. The experiments show that in the muscles of the rabbit there is a remarkable potentiality for regeneration in devascularised tissue, and that, in spite of anastomotic connexions, the interruption of one vessel of supply to a muscle (or one of its branches) may lead to a relatively extensive and well-defined area of ischæmia lasting for several days. This is important in relation to the infection of muscles in war wounds.

DENERVATION AND RE-INNERVATION OF VOLUNTARY MUSCLES

Dr. RUTH BOWDEN demonstrated the importance of maintaining function in voluntary muscles denervated as a result of peripheral nerve injury. In such cases atrophy is most rapid in the early stages of paralysis,
when
with
tion
plate
they
the muscle may resemble tendon. Up to a year after denervation one may expect a fair degree of functional recovery; nevertheless, the atrophy and replacement by connective tissue starts from three months onwards. The reversibility of the changes in muscle depends on such things as sepsis, age, mobility of the limb, and physiotherapy, as well as on the nature of the lesion in

of through nerve. The response may disappear altogether if atrophy is advanced. Electromyography reveals, for example
llation,
which persists as l
tractile
fibres remain, and
tential
noticed during the
This sort of investigation does not give quantitative estimates of the re-innervation, and is not yet completely reliable as a guide to prognosis. Dr. Bowden stressed the value of galvanism in maintaining muscular activity, and in limiting the degree of atrophy. It must be regular, and be started as soon as possible after injury. Contractures which may develop in denervated musc
because of the connective-tissue formation can be retarded
be prevented by daily
movem
range of the joints of
the lim
muscles should never maintain complete immobility.

WAR SURGERY

Lieut.-Colonel E. A. MACNAUGHTON, RCAMC, described the technique of early wound closure and treatment in plaster of ten compound fractures of the femur. His report dealt not so much with the immediate primary treatment—excision of the wounds, and general treatment with blood-transfusions, penicillin, and sulphonamides—but with the next stage, a week or so later.
eatment had been adequate,
compound fractures were
drainage, at this stage. Closure was accompanied by accurate reduction of the fracture, and where required stainless steel wires or vitallium screws were used in its fixation, without prejudice to wound healing. This fracture fixation was, where suitable, done through the existing soft-tissue wound. Colonel MacNaughton emphasised the importance of adequate preparation of the patients for operation by rest (patients were usually tired from travelling), replacement o
after operatic
wounds in the
which followed, some diffidence was expressed about the use of metallic fixation in such cases.

Lieut.-
tioned the value of
wounds.
This, ho
cision has
been ade
d do not penetrate far into crevices, where it is often important to maintain a high concentration of the drugs; this could be ensured only by adequate general administration.

AMPUTATIONS

At Queen Mary's Hospital, Roehampton, Mr. F. G. ST.CLAIR STRANGE read a paper on the *Amputation Stump, in Health and Disease.* The amputation stump must be considered a new and normal organ, on the perfection of which will depend
of the patient. The state of
evenly truncated cone, having
and scar mobility which follow
and with no scarring or œdema in the subcutaneous tissues. The stump requires an internal scar, between the cut surfaces and the top surfaces of the flap; normal structure and function of the muscles inserted into
stump; rounding off of the bone end, with its
layer of compact bone; and the special a
function in the stump to control the
Strange
pla
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pe
be rounded, and should contain
retain lymphatic, blood, and ne.

There must be minimal trauma of nerves. Bone and periosteum must be cut at the same level. Careful hæmostasis must be followed by artistic skin suture. A neat stump, besides being physiologically sound, gives the [illegible]ble sense of æsthetic achievement, and [illegible] good psychological start to his life as [illegible]'og-ears," and other redundancy must be avoided, the flaps just meeting over the end of the stump. Postoperative care must avoid the development of flexion contractures. There must be minimal disturbance of dressings; elastic stump bandaging should be used from the 12th day, to shrink the stump without forming a "waist"; non-resisted exercises should be encouraged from the 12th day, whereas pro- [illegible] xercises do *not* begin until 3½ weeks [illegible] With a thorough regime stumps are ready for measuring in 4–6 weeks, and are ready for limb-wearing by the time the artificial limb is made. Throughout the consideration of re-amputation, Mr. Strange emphasised that in spite of the use of penicillin and sulphonamides surgical first principles must be followed—the operation should be approached in the same spirit as, for example, a bone graft for an old compound fracture. One must have an absolutely aseptic field, and adequate time must be left after the healing of the original sepsis before re-amputation is embarked on.

Prof. N. PRIOROV gave a résumé of the experiences with amputations in a large area under his control in Russia. Plaster was applied to the stumps to facilitate transit in cases of primary guillotine amputations in field hospitals. First dressing was never done before the 8th day. Secondary suture of long skin flaps was often done with sutures inserted through plastic buttons, which can be pulled up gradually until closure is effected. The operative techniques were essentially the same as in this country, except that the end of the bone canal is usually tamponed with muscles. Temporary bucket peg-leg prostheses are extensively used.

Mr. GEORGE PERKINS emphasised the importance of the deep fascia and its treatment in providing a mobile scar.

Colonel STOUT, NZAMC, said that in the New Zealand Army all their amputations were left open until the 4th or 5th day, and sutured then; they were expected to heal by primary intention.

Major MATHER CLEVELAND, MC USA, said that the American Army surgeons were told to carry out circular amputations at the lowest possible level. In most cases these were followed by skin traction within a plaster bucket. The soldier was then immediately evacuated to the interior, where definitive treatment was carried out.

Prof. T. P. MCMURRAY asked surgeons not to be hasty in carrying out amputations; even a bad limb of his own might be more acceptable to a man than an artificial one.

Dr. A. J. CRAFT demonstrated all the standard limbs supplied by the Ministry of Pensions.

Mr. R. D. LANGDALE KELHAM, in a paper on amputations in children, stressed the need for making stumps as long as possible, because the stumps of children do not grow as much as their normal limbs.

Colonel REX DIVELEY, MC USA, presented a cinema film, dealing with the life of a man who had two arms amputated and yet attained a high degree of independence.

Major JOHN CHARNLEY, RAMC, demonstrated an adjustable weight-bearing calliper splint, designed on the Thomas principle but suitable for mass-production in a variety of standard sizes, having a ring for ischial bearing which was adjustable within limits for different thigh circumferences, and upright irons which were adjustable for length by a screw-fitting extension. With a suitable supply of basic parts, fitting and supplying such an appliance took an hour or two, compared with the several weeks required for a made-to-measure product.

During the meeting honorary membership was con[illegible] on Sir ALFRED WEBB-JOHNSON, PRCS, and on [illegible] RHIADR-JONES, chairman of the executive committee of the Central Council for the Care of [illegible]

Reviews of Books

The Sick African

A Clinical Study. MICHAEL GELFAND, MB CAPE TOWN, MRCP. (Post-Graduate Press. Pp. 357. 25*s.*)

THOUGH not a textbook of tropical medicine, this comprehensive study of African diseases, tropical and other, shows the author to be an acute observer and a sound clinician. The book is designed to help, primarily, those coming into contact with sick Africans for the first time. These at present are bound to be mostly European, since qualified Africans are as yet few. Dr. Gelfand has therefore wisely given a good deal of attention to the differing aspects of disease as they affect Europeans and Africans. These differences are not only physical and clinical, but include psychological and environmental factors. The low level of housing and hygiene, the faulty diet, the long distances to be travelled in search of medical aid, and the scanty funds available for that aid all colour the picture and are especially emphasised in the first two chapters. Dr. Gelfand makes no attempt, however, to arrange his material in scientific order, and the table of contents is somewhat haphazard. The order of the chapters is partly based on the frequency with which a disease occurs; thus the first three chapters are on malaria, bilharziasis, and ankylostomiasis, after which come the usual tropical diseases (or diseases now considered tropical), fevers, venereal disease, diseases of the heart, and of the respiratory and nervous systems, &c. Diagnosis, symptoms, and treatment are given pride of place; pathology is not dealt with in detail, and the book does not attempt to include surgical treatment. The account of the prophylaxis of preventable diseases is rather scrappy, perhaps because Dr. Gelfand thought it outside the scope of the book. Possibly the advent of DDT may make him more hopeful. Nevertheless, the book is likely to become a vade mecum to doctors in Africa, as well as to others who may have to treat sick Africans when no doctor is available.

War Surgery

Lectures by Various Authors. (British Medical Students Association. Pp. 67. 2*s.* 6*d.*)

THE British Medical Students Association invited eight well-known surgeons to address them on some aspect of war surgery, and these lectures proved so popular that it was decided to publish them. Sir James Walton on recent advances, Mr. Tudor Edwards on chest wounds, Mr. McIndoe on facial injuries, and Sir Ernest Rock Carling on burns give summarises of their subjects which will be as useful to the experienced as to the novice. Rear-Admiral Gordon-Taylor contributes an article on surgery in Russia, and Dr. J. Trueta discusses the treatment of wounds in plaster-of-paris. Major-General Max Page, on surgery in the field, had too large a subject for compression into one lecture. Colonel Elliott Cutler gives his views on first-aid in a lecture whose language is refreshingly informal and whose contents show how various snags, particularly in first-aid in American aircraft, have been overcome.

Black's Medical Dictionary

(18th ed.) J. D. COMRIE, MD EDIN., FRCPE. Editor: H. A. CLEGG, FRCP. (Black. Pp. 998. 18*s.*)

THIS popular reference book has achieved a very large circulation since its appearance in 1906, and up to his death in 1939 all revisions were carried out by the author, Dr. J. D. Comrie. It is important that a work so widely consulted by the lay public should be both accurate and up to date: Dr. Clegg has done valuable service in preparing the 18th edition, in which both these objects have been achieved.

The Public Attitude towards Mental Disease

and Urgent Reasons for Early Treatment. (2nd ed.) HORACE HILL, MRCP. (Bennett. Pp. 35. 2*s.* 6*d.*)

THERE are still many members of the public who have superstitious or distorted notions about mental disorder. Dr. Horace Hill has published a brochure which indicates briefly and simply how desirable it is that the relatives of an insane person should not put off admission to a mental institution as long as possible, but should rather obtain for the patient the benefits of early treatment.

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THE LANCET

LONDON: SATURDAY, JANUARY 6, 1945

Who should Feed the Sick?

FOR those engaged in hospital catering the welfare of the patient is seldom the sole criterion of success. Thus in many municipal hospitals food is entirely in the hands of the steward and his clerks, men so well trained to respect public money that they often see economy as a measure of efficiency. In voluntary hospitals responsibility for the patient's diet is usually borne by the secretary or the matron, both of whom must keep in mind other considerations such as cost, the staff of the kitchen, and the work entailed for nurses. Even the best intentions can be dissipated by such division of loyalty, and, in addition, the persons concerned usually lack the special knowledge needed for their task. Consequently, though a few hospitals can fairly take a pride in the meals they provide, they are only exceptions to a thoroughly bad rule.

That this situation has arisen is one of the anomalies of medicine. The earliest hospitals looked to the friends of the patient to bring him food, or else supplied his bare wants out of charity. When convenience made the feeding of the sick a part of hospital care it was still undertaken as a charitable duty, not as a part of treatment. Doctors as a whole never seem to have felt responsible for it. But we have no right to this philosophic detachment, for every day the good results of medicine and surgery are nullified or delayed by failure to apply the most elementary principles of invalid feeding. Those who keep their eyes and ears open will not lack examples—the flatulent "abdominal" who is expected to cope with beans and under-boiled potatoes; the young child given strong tea instead of his accustomed milk; the patient awaiting admission to a sanatorium whose food is so scanty and unattractive that he steadily loses weight; the men at a spinal centre, many with bedsores, whose condition deteriorates on a small, monotonous, and distasteful diet. A large proportion of patients, urged to speak frankly, will tell a story of this kind from their own experience of hospital—people whose standard of adequacy is by no means high. Moreover, studies of diet in hospitals show that, even in some of the most famous, the patient cannot expect to get the full sugar and fat rations to which we are all entitled. The hospital, faced with the task of getting sick people back to work quickly, is often less careful for their proper nourishment than was Lord WOOLTON, tightening their belts for war. Moreover, improper social distinctions have crept into hospital feeding. Thus officers may have good food at the expense of other ranks in the same hospital, who do not always get enough, and "surplus" rations from the public wards may be used to make sweets and puddings for the private patients' supper. This sort of thing cannot possibly be justified. Rations leave no margin for generosity to the well-to-do.

That food should be unattractive is bad enough: that it should be insufficient is a failure which as doctors we should never have countenanced. From these defects it follows that in many cases the diet, instead of supporting treatment, is in active conflict with it; and that the patient only begins to derive full benefit from the care of his doctors after he has gone home. True the science of dietetics is still young; but HIPPOCRATES and GALEN long ago knew well enough what weight to give to regimen. In letting the feeding of patients develop along such casual lines we have been negligent and irresponsible; and however difficult and inconvenient it may be to change existing customs we must see that this is done. It is a task for the heads of the profession: registrars, junior medical officers, and newly appointed dietitians have not the power or influence to correct the errors and inadequacies which they witness daily. Often the dietitian who tries to enforce her recommendations finds herself directly up against nursing or administrative interests. It is for those whose voices carry weight on the governing body of the hospital to insist on reorientation.

A feasible plan of reform was put forward more than a year ago by King Edward's Hospital Fund.[1] This suggested that every hospital should have a permanent food-service committee representative enough to clear the various administrative and professional hurdles—the financial responsibilities of the catering officer or purchaser, the choice and quantity of foods recommended by doctors and dietitians, and the staffing puzzles of the matron. The attitude of the finance department has important repercussions on food. Some of the apparent economies of today—such as the inexpensive cook—may be false economies financially as well as medically. Thus the Fund records that in one large hospital where the wages of the entire kitchen staff amounted to £1000 a year, £20,000 a year was spent on food until a more experienced staff was engaged, at twice the wage; then—thanks to expert buying, checking, costing, and cooking—the total expenses fell by £6000, while the diet improved. The type of kitchen staff who are willing to work for low wages are not as a rule those who have an intelligent interest in diet; and monotony, bad cooking, and a tendency to do everything the easiest way characterise the stupid cook, whether she works in the hospital kitchen or in her own home. Buying, like cooking, is a task for an expert. Matrons and housekeeping sisters have seldom had specific training in it, and in any case are never given financial control. Secretaries and stewards may have experience of its financial side, but not of its dietetic implications.

It is not yet possible for every hospital to appoint a qualified dietitian with experience of catering, and give her a free hand; for there are only 271 dietitians in the country. Dietetic diploma courses are offered by four bodies—King's College of Household and Social Science, the Royal College of Nursing, Edinburgh Roya[illegible] and West of Scotland [illegible] of which require stu[illegible] year or eighteen m[illegible] practical training in the dietetic department of a recognised hospital. This practical work is largely in the diet kitchen and wards, for first-hand experience of large-scale catering is not at present considered essential for the diploma; so the British Dietetic Association suggest that in future new diplomates should make a point of gaining such experience before taking appointments. But reforms need not wait for the training centres to turn out enough dietitians to go round. Mrs. Beeton took no degree in housekeeping, and Florence Nightingale was not an SRN. Probably in every hospital there are one or two people with the character and initiative to change the picture if they once became infused with the crusading spirit, if they knew a little more, and if they could come by the necessary power. That it would take very little to rouse them was evident from the attendance at a refresher course in catering arranged by King Edward's Hospital Fund in May of this year. Invitations were sent to all the voluntary hospitals in the London area, and 65 of these sent some 150 representatives, including secretaries, matrons, stewards, assistant matrons, dietitians, catering officers, housekeeping sisters, and cooks. They were ready and anxious to learn.

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[1] Memorandum on Hospital Diet, 1943. 6*d.*; and see *Lancet*, 1943, ii, 673.

What is needed then? Modern equipment, certainly; and more cooks and dietitians as soon as we can make them: but above all, champions with authority. In every hospital some or all of the medical staff should be backing this essential reform with their might. Good diet is as necessary to recovery of health as good nursing, surgery, or medicine, and it is folly to pretend that it is beyond the power of our profession to change this reproach. It has been created through our indifference and idleness and must be removed by a bit of hard work.

Arterial Advances

In 1919 Sir George Makins, FRCS, published his red-faced book which tells the story of gunshot injuries of the blood-vessels in World War I. A more thorough study could not be imagined, and the opinions there expressed have held fast, for they were based on close factual observation. Subsequent writers on vascular surgery have leaned heavily on Makins for their inspiration, though the years between the two wars have seen great advances. Particularly important have been the clinical studies on the behaviour of peripheral vessels under normal and abnormal conditions. A new era of "physiological" vascular surgery began with the development of sympathectomy, and the early optimism has given place to firmer knowledge of its indications and limitations. The isolation of heparin opened up a new field by bringing one hazard of vascular work—thrombosis—under control. Then came the sulphonamides and with them a real hope of controlling that other hazard—sepsis. War provided the opportunity to test these advances, and the experiences of five years are reviewed and applied in a new memo on arterial injuries, produced by a Medical Research Council subcommittee under the chairmanship of Sir Thomas Lewis.[1] Marked "for beginners," it has nevertheless been packed with much sound advice that should be absorbed by all.

Most surgical textbooks do not give us the simple clinical details of what happens to a limb when its blood-supply is cut off. This is lucidly described in the memo, which sets out the principles of treating the partially or completely divided vessel and the subsequent care of the ischæmic limb. Special vascular centres have now been established in Britain, and it is important to transfer suitable cases to these centres early, so that full physiological observations can be undertaken. The memo is not concerned with the later complications of vessel injuries, such as the arterial or arteriovenous aneurysm. These partial lesions have not been common in this war, for the destructive force of the modern missile tears and disrupts the surrounding tissues and thus prevents the imbrication of overlying layers necessary for the hæmatoma formation which is an essential preliminary to the development of an aneurysm. Moreover, there is often gross destruction of the collaterals as they run in the muscle and bone; and the extent of this damage, rather than reflex vascular spasm, is now regarded as the main factor deciding the onset of gangrene. The memo points out that a femoral artery injury, if associated with damage to the femur, is almost invariably followed by gangrene and is an indication for primary amputation. Popliteal vessel injuries too have acquired a sinister reputation in this war. Ligature, however, has not always been followed by gangrene. Thus if a small splinter divides the vessel the adjacent tissue injury is usually slight and ligature may then be successful. But where the missile is of fair size the local collaterals are certainly destroyed and gangrene usually follows. Le Gros Clark [2] has recently demonstrated experimentally that the missile may also throw the arterial collaterals along its track into spasm. The memo advises that the vessels should be ligatured as close as possible to the site of division, excising of course the contused ends; more remote ligature deprives the limb of important muscular collateral branches. Holman [3] disagrees, declaring that the large artery—especially the brachial or femoral—should be ligated between the main collateral branches and the intervening segment excised. He maintains, on experimental grounds, that part of the force of the stream is otherwise wasted in the blind end and the pressure in the collateral vessels will be found slightly reduced. Such slight falls in pressure are not, however, in themselves significant, for experimentally the pressure in the distal segment of the divided vessel may fall to a third of the systolic pressure (from 110 to 40 mm. Hg) and yet there be no interference with the recovery of the distal limb circulation.[4] That vessels should not be ligatured in continuity has been stressed time and again. The strangling effect of such ligature, and the "battering" of a fixed point in the stretched vessel, are likely to lead to necrosis and sloughing. It is difficult to convince the beginner of this, for he will believe that a terminal ligature runs the risk of being kicked off by the vessel's pulsation. As Holman [5] has stressed, when the vessel is divided there results a gap between the ends, and the force within the vessel is spent in stretching the relaxed elastic wall, so little strain falls on the actual ligature site. There is some difference of opinion as to the ligature material to be used, and the memo make no particular recommendation. MONT REID[6] brought forward good evidence that fine silk, doubled or more, was to be preferred, but with careful primary surgery catgut has on the whole served well. Vessels have of course, their crucial points of ligature, and at times, especially in the "cold" aneurysm operation, it may be possible to select the ligature site. DE TAKATS[7] has drawn attention—and so does the memo—to some of the more suitable points for subclavian, axillary, and popliteal ligature.

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[1] Arterial Injuries: Early Diagnosis and Treatment. Medical Research Council War Memo No. 13. HMSO. Pp. 24. *4d.* The Vascular Injuries Subcommittee of the MRC War Wound Committee consists of Sir Thomas Lewis, FRS (chairman), Air-Commodore Stanford Cade, FRCS, Sir Ernest Rock Carling, FRCS, Mr. S. M. Cohen, FRCS, Prof. J. H. Gaddum, SC D, Surgeon Rear-Admiral G. Gordon-Taylor, FRCS, Major D. Ll. Griffiths, FRCS, Prof. J. R. Learmonth, FRCSE, Mr. B. C. Maybury, FRCS, Prof. J. Paterson Ross, FRCS, Dr. D. S. Russell, Lieut.-Colonel H. P. Simmons, FRCS, Prof. E. D. Telford, FRCS, and Dr. F. H. K. Green (secretary).

[2] Le Gros Clark, W. E. BOA meeting Dec. 15, 1944, reported in this issue.

[3] Holman, E. *Surg. Gynec. Obstet.* 1944, 78, 275.

[4] Charnley, J. *Brit. med. J.* 1944, i, 716.

[5] Holman, E. *Surg. Gynec. Obstet.* 1942, 75, 183.

Ligation puts the onus on the collateral circulation, which expands and repairs itself more rapidly than we used to imagine. To maintain the ischæmic tissues alive during this stage of repair is therefore the fundamental in treatment. The memo sets out clearly the management of such a limb. First and most important is attention to the patient's general condition; the limb circulation appears to be rationed until the general condition improves. The memo recommends blood rather than plasma for transfusion, and plenty of it. The need to damp down the metabolism of the ischæmic limb by resting it and keeping it cool is now well apprehended. But there is less agreement on the measures for "forcing" the collateral circulation. The value of sympathetic block is debatable; although as a preliminary to operation for the arterial aneurysm, where the collateral circulation is already established, it certainly has a place.[8] Ligation of the main vein at the same time as the artery is recommended, without enthusiasm, in the memo. There has been a trend against it, and surgeons in the Middle East and the *Field Surgery Pocket Book* regard the evidence in its favour as "not convincing." WILSON in 1933[9] also concluded that the "supposed benefits of venous ligation have not withstood experimental trial." But MAKINS's vast experience cannot be ignored, and especially on the other side of the Atlantic such vein ligature is favoured. REICHERT's[10] ingenious animal experiments showed that if all the tissues of a limb are divided except the bone, artery, vein, and nerve, and then sutured, by the seventh day the artery and vein can both be ligated without precipitating gangrene, whereas if only the artery is ligated gangrene will follow unless the ligation is delayed until the fourteenth day. Such collateral vessel damage closely mimics the conditions in gunshot injuries.

In war surgery arterial ligature obviously has its limitations, for to tie the vessel when there is extensive collateral damage is to court gangrene. Re-establishment of the main arterial stream is our obvious ideal, but end-to-end suture, as the memo points out, is rarely feasible, since excision of the devitalised ends leaves an enormous gap. Besides, such patients have usually lost much blood, and the heat of battle is scarcely the time for delicate vascular work. Other methods are being tried, some as yet in the experimental stage. The memo refers to the work of BLAKEMORE, LORD, and STEFKO,[11] who devised 'Vitallium' cannulæ through which they threaded segments of vein taken either locally or from the saphenous vein. The vein is turned back like a cuff over the ends of the cannula, which are then inserted into the ends of the divided vessel. Blood thus circulates through a vein-graft without being in contact with any metal. Experimentally this method has been particularly successful even without heparin, and it has been carried out in the presence of deliberate mild sepsis.[12] In dogs it was possible to amputate the limb, refrigerate it for 24 hours, and then restore the circulation again by this method. It has been successfully used on a child with a divided brachial artery. The cannulæ are now issued to the American Army, and we understand they have had one successful case already. Those who have tried them declare, however, that the cannulæ are difficult to manage, and the technique is not as easy as it appears. In animals SPIEGEL, FRIEDLANDER, and SILBERT[13] have used the distal end of the divided vessel as a means of autotransfusion, and thus maintained the life of the limb until the collateral circulation was restored. There are several problems to be answered before this method can be applied to man. We do not yet know how much blood such a limb should receive, though we know that it must be only a fraction of the normal or anasarca soon develops. The extracorporeal oxygenation of venous blood also deserves further study, for it may enable us to maintain human limb preparations and thus pave the way for controlled human vascular experiments. The memo recommends the temporary use in selected cases of the Tuffier cannula with heparinisation. This will tide the patient over while his collateral circulation is developing, and will do much to prevent the onset of gas-gangrene in the distal ischæmic limb. Such heparinisation is of course only possible if there are no other gross injuries. With the control of wound infection now possible an entirely new field of vascular work has been opened up—the delayed repair of the vessel. In 1940, after animal experiment, MURRAY and JONES[14] advocated the use of glass cannulæ (and air-raid experience has shown how inert glass is within tissues) as a temporary measure to bridge the vessel gap. They suggested that the patient could then be heparinised and transferred to a better equipped hospital for vessel repair. MURRAY,[15] in his Hunterian lecture in 1939, showed that experimentally heparinisation enabled a vein graft to be used to bridge a gap in an artery, and he recorded successful vein-grafting in man. This operation has been carried out in the Canadian Army on two cases, temporary cannulæ being replaced by venous grafts on the third day. It is particularly pleasing to note that the MRC have taken on themselves the responsibility of collecting and evaluating such advances for the multitude of surgeons.

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6. Reid, M. R. *Surg. Gynec. Obstet.* 1934, 58, 287.
7. De Takats, G. *War Med.* 1941
onth, J. R., Richards
13.
1931, 49, 86
11. Blakemore, A. H., Lord, J. W., Stefko, P. L. *Surgery,* 1942, 12, 488
12. Cabled information (not published).
13. Spiegel, R., Friedlander, M., Silbert, S. *Surg. Gynec. Obstet.* 1943, 77, 162.
14. Murray, G., Jones, J. M. *Brit. med. J.* 1940, ii, 6.
15. Murray, G. D. W. *Brit. J. Surg.* 1940, 27, 567.

NHS or NHI+ ?

Some two months ago a group of Conservative MP's headed by Sir Arnold Gridley suggested in the *Times* that immediate steps towards a National Health Service should be limited to the organisation and distribution of hospital and consultant services, with extension of medical benefit to the dependants of those people already covered by National Health Insurance. This view is of course shared by many doctors, as was clearly shown in subsequent correspondence as well as at the Panel Conference and the annual representative meeting of the British Medical Association. Many who have long demanded these two reforms, and have had little encouragement from Government quarters, are understandably suspicious now that the Government, sweeping aside their suggestions, propose much greater changes. They would like to see their first two steps taken first, and only after that advance is made and consolidated would they be willing to contemplate more radical alterations. Indeed, Sir Frederick Kay Menzies, from his great experience of medical organisation, argues that progress by stages is necessary because it will take at least 20 years to evolve an efficient service for the entire population—an interesting commentary on the care the public now receive.

The opposing view has been expressed by the *Times* itself and by the Tory Reform Group of MP's, writing on Dec. 22. Briefly this view is that the limited reforms proposed would only be of interim value: as they could not provide a health service capable of fulfilling the demands of the social security plan, they would soon have to be superseded by a more comprehensive scheme: and the difficulties of introducing them would be so little less than the difficulties of the wider scheme that it would be wasteful of time and energy for the Government to do otherwise than plan and negotiate for a comprehensive and universal medical service from the first. The medical profession as a whole has not yet perhaps sufficiently appreciated that a large extension of medical services is necessary to the working of the kind of social security legislation now in prospect. The Tory Reform Group make this point emphatically when they say:

> "We cannot contemplate the payment of benefits on a substantial scale to all who have lost their earning power through sickness or industrial accident or disease unless the claim is backed by a doctor's certificate and unless medical attention, including whatever is necessary in the way of specialist or hospital treatment and rehabilitation, is provided in order to restore earning power at the earliest possible moment. To limit these advantages to the present beneficiaries of National Health Insurance and their dependants neither simplifies nor improves the white-paper proposals."

Even extension of this system to provide a specialist and hospital service would involve wide administrative alterations. As Mr. Hugh Linstead remarked on Tuesday, extension of the panel would raise the same problems as the larger scheme, "with the disadvantage that you are committed to use old machinery."

However there need be no fear that the experience of insurance practice over the last thirty years will be overlooked when negotiations begin. The BMA have chosen among their 16 representatives on the Negotiating Body no less than 14 members with long practical experience of general and insurance practice: in fact, 8 of them belong to the present Insurance Acts Committee, and of these Dr. H. G. Dain and Dr. E. A. Gregg probably have greater detailed knowledge of the history and practice of NHI than any other two men in the profession. If the guidance of our representatives is heeded it is likely that the new service, whatever its final framework, will retain all those attributes of the panel system that have been found fairest and best both for the patient and doctor. The Tory Reform Group urge their Conservative colleagues not to embarrass the Minister of Health by making restrictive proposals, but allow him "a fair field in which to negotiate with the appointed representatives of the profession." The time has come when the profession, with confidence in its negotiators, should exercise similar restraint, reserving critical suggestions until more is known of the ways in which the Government are willing, or can be persuaded, to modify the white-paper proposals.

Annotations

UNRRA AND NORTH-WEST EUROPE

"The hungry sheep" of the liberated countries "look up and are not fed," and many people here are beginning to ask the reason why. Before the Allies invaded Europe the Germans were in the habit of telling the occupied countries that though they might dislike conditions under the Reich, they would still more dislike being liberated. In the strictly material sense, thanks to the disruption of modern war, this may have proved true.

Since Unrra is ostensibly the relief organ of the United Nations, it is being widely blamed for the present state of affairs. Most of the critics, however, do not understand the political and administrative limitations on Unrra's power to act, or the practical difficulties involved—above all in transport. As a correspondent points out on p. 28, before Unrra can pr any country, two conditions must be fulfi be invited to operate by the government , and (during the so-called military period of relief) it must also be invited by the military authorities. Today, if the governments of, say, France and Belgium ask Unrra for supplies, all that Unrra can do is to refer them to the Civil Affairs division of Supreme Headquarters Allied Expeditionary Force (Shaef). Responsibility for the present situation thus rests squarely on the military, just as it did in Madagascar, Syria, North Africa, and Italy, before Unrra was created. Faced with criticism, the military answer is that the critics are evidently unaware of the shortages of shipping, of ports and port installations, and above all of inland transport in the form of usable roads, railways, locomotives, rolling stock, and lorries. These shortages make it impossible to supply both the armies and the civil populations. Even stores required by the Forces, it is said, are held up at the arrival ports through lack of transport—of which a modern army never feels it has enough, still less a surplus.

As regards supplies in large quantities, such arguments are no doubt valid. It probably is impossible at present to raise, for example, the calories of Belgian heavy workers substantially above the 1600 they now get daily, or to import the coal and raw materials for want of which industry is standing idle. But such considerations do not apply to the small quantities of medical supplies urgently needed in certain areas. If it is true that people are dying in one area for lack of an amount of insulin which could be carried in a suitcase; if in other areas there are towns without a single bandage; if the essential medical supply needs of Belgium could be satisfied by one transport plane a week, or one trawler month, then such small amounts of transport should be made available, either to Civil Affairs or to UNRRA. We suspect that such matters are overlooked or postponed just because they are so small, and that a man thinking in terms of shells for an army is not likely to see the relative importance of a package of insulin. Moreover, the objectives of Civil Affairs and UNRRA are not identical. The primary aim of Civil Affairs is to prevent civilian problems from hampering the armies; the primary aim of UNRRA is to provide relief. Now that the armies are handing over to the French Government complete control of the *zone intérieure* of France, it should be possible for UNRRA to begin its own work of relief even on a small scale. But it must be given the small but essential transport facilities required.

PREGNANCY TESTS

THERE are now three tests for pregnancy which depend on the demonstration of an increased quantity of chorionic gonadotrophin in the urine. It is hard to know what names to use for them. Reference to the animal employed may lead to confusion; the "mouse" test sounds all right, but the "rabbit" test is often misheard as the "rapid" test, and as for the third, the animal is strictly speaking neither frog nor toad, and "xenopus" sounds rather pompous. The use of eponyms is the commoner practice, though the names Aschheim, Friedman, and Hogben are frequently misspelt.

The Aschheim-Zondek test has already proved its reliability, and for many years Professor Crew was able to report a very low percentage of error with it from the Edinburgh Pregnancy Diagnosis Station. Almost every step in the procedure, from the preliminary weighing of the mice to the diurnal injections, the gassing, and the dissection and mounting of the ovaries, can be left to the trained technician, and only the inspection and reading of the ovaries need be undertaken by the director of the station. A big colony of mice, or a reliable supplier, is essential. By using 5 mice for each test, the occasional refractory animal is virtually eliminated, and false positives should be rare provided the weight, and therefore the age, of the mice has been carefully checked. The great disadvantage of this test is that it takes 5 days to perform.

The Friedman test, which is now almost as well known, is perhaps more suited to the smaller laboratory than to the pregnancy diagnosis station. Small numbers of doe rabbits need to be kept in stock and each strictly segregated not only from bucks but from other does. The intravenous injection of the untreated, or simply filtered, urine demands some technical skill which is acquired by practice. Results may be read in 48 hours. The test animal can be eliminated as a possible source of error. A preliminary laparotomy will allow inspection of the ovaries before the test is begun; 48 hours after injection of the urine for diagnosis another laparotomy may reveal the characteristic corpora lutea and hæmorrhagica of a positive test, or it may reveal no change in the appearance of the ovaries. Injection of a known urine of pregnancy will now make sure that the individual rabbit will respond to chorionic gonadotrophin, and that the appearances found after the second laparotomy were those of a true negative test. This procedure, while bestowing on the test a high degree of accuracy, renders it unsuitable for use on a large scale.

The Hogben test has the great advantage of speed, and only those familiar with pregnancy diagnosis tests will appreciate how important that is. A woman, content to have missed her period by many days, will suddenly decide that she must know at once whether she is pregnant or not. Xenopus will give her the answer within a day. For some years difficulty was experienced in this country with the Hogben test because it was impossible to breed the animals. This difficulty has now been overcome. There is nevertheless one serious disadvantage to the test—if untreated urine or alcohol-precipitated extract is injected, it kills 15% or more of the animals. Preparation of the urine to make it less lethal is an elaborate process depending on the adsorption of the gonadotrophin on kaolin, but in a pregnancy diagnosis station this can of course be carried out on a a large scale without seriously inconveniencing the organisation. It is advisable to kill animals not showing extrusion of ova overnight, for in some cases ova are found in the oviducts on post-mortem examination and an apparently negative test may prove to be positive.

From each of these three standard tests an accuracy of about 98·5% may be obtained provided a detailed technique is developed in the hands of experienced workers. The Friedman test is suited to the small laboratory with a qualified research-worker who will conduct most of the steps of the tests himself. The Aschheim-Zondek and Hogben tests are more suited to the pregnancy diagnosis station, where such manipulations as multiple injections of animals and chemical preparation of the urine can be placed in the hands of trained technicians, the reading of results being alone left to a qualified director. Under such conditions minor variations in technique assume less importance.

NUCLEAR TISSUE

THE basis of practically all histology is the use of stains which distinguish the nucleus from the cytoplasm. By this device the minute structure of the whole body has been made out, and the sequence of changes which the nucleus undergoes in cell division has been observed. These are matters of common knowledge to most of us, however long ago we may have taken our final MB, but within the last 25 years the irrepressible biochemists have greatly disturbed this quiet little medical backwater. Their achievements, recently reviewed by Davidson and Waymouth,[1] now constitute an important development in medical science.

The nucleotides are the basis of all nuclear structure and there are, broadly speaking, two kinds. Both contain a purine or pyrimidine base, a carbohydrate and a phosphoric acid group, but they differ in that in one the carbohydrate is desoxyribose and in the other ribose. This apparently minor structural change confers considerable functional differences on the nucleotides. Those containing desoxyribose condense into molecules with molecular weights of upwards of 1,000,000, and are characteristically found in the nuclei of cells. The others condense less readily and are found mostly in the nucleolus, the cytoplasm, in cells without visible nuclei, and in viruses. Nucleotides containing ribose and adenine act as co-enzymes in cell respiration, and it is interesting to recall that two of the B vitamins—riboflavin and nicotinic acid—also enter into the composition of these enzyme systems.

Ribose nucleotides are broken down by an enzyme which has now been isolated and crystallised. This enzyme is heat-stable—i.e., it is not destroyed at 100° C—and it has been prepared and utilised to differentiate the two kinds of nuclear material in cells. Within the last 8 years a method of "staining" nuclear material has been introduced by Caspersson of Stockholm. The purine and pyrimidine bases absorb ultraviolet light much more intensely than any other cell constituents, and by using this light and photographing the cells through quartz lenses the distribution of nuclear material and alterations in its concentration can be followed. Both these techniques have contributed greatly to our recent knowledge, but there are other contributors, one of them being the ultracentrifuge. By this instrument macromolecular complexes can be isolated. The nucleic acids form just such complexes with other cell constituents, and proteins and phospholipins have been identified in them. Some of the infective agents, such as the virus of the Rous sarcoma, have been shown to contain these phospholipin complexes, but they are not confined to such material and were first isolated from embryonic tissue. Methods of separating the nuclei from the cytoplasm by mechanical means have also been devised, and these enable the nuclei to be subjected to analysis, not only for proteins and nucleic acids, but also for minerals.[2] The structure of the nucleoproteins is analogous to that of some of the oxidising enzymes, and it is tempting to picture them acting in some such capacity in the cell. They are, however, characteristically associated with self-reproducing systems or agents such as genes and viruses, and it is in conferring this property upon a tissue that they appear to exert their major rôle. It has been suggested that the ribonucleic acids enable the cytoplasm to grow and reproduce itself.

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[1] Davidson, J. N., Waymouth, C. *Nutr. Abstr. Rev.* 1944, 14, 1.

One of the problems still to be solved is the metabolic relationship of the ribo- to the desoxyribo-nucleic acids. Mitchell, working at Cambridge, believes that ribonucleotides accumulate in the plasma of rapidly growing cells, and that these are then changed into desoxyribonucleic acid and deposited in the nuclei, which reproduce themselves at cell division. This is an interesting suggestion, but the conversion involves the reduction of the ribose and the methylation of a pyrimidine base. Neither of these reactions has been shown to occur in vivo, but both are inherently possible. This must await further investigation, but meanwhile knowledge of fundamentals is rapidly accumulating, and with any luck some of it will be of direct value to therapeutics.

BRACHIAL NEURITIS OR HERNIATED DISC?

Until about ten years ago it was generally believed that sciatica was due to sciatic neuritis or radiculitis, a form of interstitial neuritis almost equally familiar in the upper limb as brachial neuritis. Now most experts agree that sciatica is usually caused by a herniated intervertebral disc, and it is not surprising that this discovery should have aroused fresh interest in brachial neuritis. Is that long-accepted diagnosis based upon an equally insecure pathology? On another page Major Elliott and Major Kremer report 8 cases of brachial pain which they attribute to herniation of a cervical intervertebral disc. They describe a fairly clear-cut clinical picture which hitherto would probably have been labelled brachial neuritis. But it appears to be more difficult to establish the presence of a herniated intervertebral disc in the cervical than in the lumbar region. In Elliott and Kremer's cases the composition of the cerebrospinal fluid was normal and Queckenstedt's test yielded no evidence of spinal block. The X-ray changes described appear for the most part to be those of spinal spondylitis, which may or may not be associated with a herniated disc, or may even produce similar symptoms. Myelography with 'Pantopaque,' when this is generally available, may make the diagnosis more certain, as in the 3 cases of this series in which it was used. Elliott and Kremer's work will help towards the recognition of one cause of brachialgia and so indirectly clarify the diagnosis of other causes.

Experience with herniated lumbar discs has shown that it takes a considerable time to assess the results of various methods of treatment and arrive at a suitable routine. Elliott and Kremer are wisely conservative. Immobilisation, either by rest or by a plaster jacket, has proved its worth in the treatment of lumbar herniations, and the same principle seems applicable to the far more mobile neck. Paradoxically, manipulation may also be effective. While theoretically this procedure involves a risk of producing compression of the cervical spinal cord, the risk must be very slight, for many patients with "brachial neuritis" have had their necks manipulated without disaster and sometimes with benefit. The indications for surgery have yet to be determined: Elliott and Kremer did not think it necessary for many of their patients, and we must remember that most patients recovered from sciatica and brachial neuritis before a surgical cause was suspected for either, and that the mortality-rate of both is lower than that of laminectomy for herniated disc.

STRESS FRACTURES OF THE FIRST RIB

In examining 55,451 routine chest radiograms in Royal Naval personnel, Alderson[1] has discovered an unexpected anomaly of the first rib in 35 cases. The site of the lesion was constantly just proximal to the scalene tubercle and the appearance varied from an irregular break, transverse or oblique, partial or complete, to a fusiform swelling of callus or of solid bone. All the subjects were males, no cases being found among the 3433 women examined, and the incidence was highest in the 15–20 age-group; 30 of the 35 were men under 25. Only 5 had significant clinical features or history—2 complained of sudden pain in the shoulder after physical training, 2 recalled local trauma in previous years, and 1 had been carrying heavy weights on that shoulder just before enlistment. In 2 cases serial observation of the repair process showed the early break and later development of callus and bone, with regression of the lesion; and in one a temporary opacity of the lung apex medial to the fracture was originally regarded as tuberculous.

Alderson regards the lesion as a stress fracture essentially similar to those reviewed by Hartley[2] in the metatarsals, calcaneus, tibia, fibula, femur, pubis, and vertebræ; but while these are due to the effects of body-weight, the present lesion is more analogous to fractures of the humerus from chronic overuse. The anatomical facts support this view. The scalenus anterior and medius are inserted into the rib on each side of the subclavian groove, and if these muscles suddenly contract the subclavian artery and lower trunk of the plexus act as a restraining strap holding down the intervening portion of rib at the point where fracture occurs. In this mechanism the first digitation of the serratus anterior and the subclavius may play some part. While fractures of ribs by muscular violence are not rare, the first rib is only uncommonly involved. But this lesion seems likely to be a gradual yielding of march fracture type—certainly not a congenital anomaly, for the line of fusion of primary and secondary ossification centres is well posterior. The frequency in youth and the fact that most of the cases were in men straight from strenuous physical training also fit with an origin in muscular violence.

THE COMPLETE BLOOD SUBSTITUTE

The discovery in Sweden has been announced of an "artificial blood plasma, capable of use by injection in the same way as real blood transfusion."[3] So far, no precise information has reached this country concerning this contribution to the transfusion problem. No more is known than the broad announcement that the substitute is a derivative of "sugar," named "dextran," which can be produced in unlimited quantities in powder form, while the reconstituted fluid can be sterilised by boiling. These features are of course necessary functions of the complete blood substitute, but it will be clear, even from the scanty facts available, that one or more of other properties, equally fundamental, are likely to be missing. The ideal blood substitute must have oxygen-carrying power, must have a molecule of size sufficient to be retained in the circulation, and should eventually be either katabolised naturally or excreted without detriment. Without oxygen-carrying power, no more than restoration of blood-volume can be accomplished. For this purpose many substances have been successfully used, including pectin, isinglass, gelatin, human albumen, human serum, and (most popular of all) human plasma. It remains to be seen whether dextran has properties equal to natural human plasma.

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[2] Williamson, M. B., Gulick, A. J. cell. comp. Physiol. 1942, 20, 116.

[1] Alderson, B. R. Brit. J. Radiol. 1944, 17, 323.
[2] Hartley, J. B. Ibid, 1943, 16, 255, 348.
[3] Times, Dec. 8, 1944.

AMERICAN VIEWS ON CHEST INJURIES

THE views formed by our own chest surgeons in the Middle East and Mediterranean theatres of war[1] were mostly upheld at the July meeting of the American Association of Thoracic Surgeons, now reported. Carter and De Bakey[2] analysed the chest injuries of other wars and showed that out of the total number of men hit on the battlefield the chest was implicated in 25-35%. Most of these cases die immediately because of the severity of their injuries or involvement of vital structures. In the present war, among those who survive to feature as "wounded," chest injuries constitute just over 8% of the total wounds. The present war has seen a real improvement in end-results, thanks to the more general provision of surgery of high standard. In spite of Churchill's[3] comment that the most important achievement of chest surgery in this war is the change of focus from the pleural space to the lung, hæmothorax remains the dominant problem. United States opinion seems to fall into line with British in advocating early and complete evacuation of the blood. This implies needling within the first 24 hours and again almost daily until the pleura is dry. Air-replacement, though facilitating aspiration, has serious disadvantages and should not be countenanced as a routine. Efficient aspiration, apart from relieving any physiological disability within the thorax, such as tension, is an excellent prophylactic against infection, and hastens restoration of pulmonary function. If infection does occur the cardinal principles governing [illegible] not be overlooked, lest a [illegible] contracted [illegible] chronically [illegible] for sound treatment in the early stages is a heavy one, and the necessity of excluding air from the pleural cavity, both during aspiration and after early operation, is not always realised. In penetrating wounds the chances of air and infection reaching the pleural cavity through a tear or slough in the actual lung substance are appreciable.

The question of conservative or radical surgery in the early treatment of pulmonary injuries seems to have been settled in favour of a fairly conservative policy, once the claims of physiological emergencies and resuscitation have been met. Extensive formal thoracotomies are rarely called for in the early stages unless some definite indication, such as an abdominothoracic injury, is present. But there is a place for modified exploration as an extension of wound revision. Obvious foreign bodies, rib fragments, and blood-clot can be removed, bleeding points secured, and such structures as the diaphragm examined for integrity. Later on, formal operations are mainly concerned with removal of foreign bodies[4] and clot. In addition, when the lung is bound down under a [illegible] that the [illegible] aratively [illegible] 1 (decortication). The Americans stress the value of intercostal nerve-block with procaine in the early treatment of painful chest injuries, and seem to make more use of endobronchial suction (tracheobronchial toilet) than surgeons in this country. A combination of these methods may have a useful place in the treatment of painful chests, and the prevention of atelectasis and pulmonary consolidation. In spite of the encouraging reports of the effects of penicillin in chest surgery there can be no relaxing of the established principles of surgical treatment in these injuries. One feature of after-treatment that is scarcely mentioned in the American papers is breathing exercises. Over here the efficient and energetic pursuit of specially designed exercises is regarded as an essential part of treatment, and has been found to shorten convalescence and hasten recovery of lung function.

NEW YEAR HONOURS

IN a world where so many able men and women are working to the top of their bent it is impossible that honours should be bestowed on more than a few of those who deserve them. But at least the long list of medical honours printed on another page recognises distinction in many branches of professional work. Sir Alfred Webb-Johnson, who receives a baronetcy, has been a progressive and vitalising president of the Royal College of Surgeons, combining affection for the past with a sense of the future. Sir Harold Whittingham, appointed KCB, is identified in our minds with the fine medical service of the Royal Air Force, which he has so ably directed since 1941. Of the new knights, Mr. Claude Frankau, as director of the Emergency Medical Services in London and the Home Counties, has borne a heavy responsibility during the past few fateful months. Brigadier L. E. H. Whitby, who, like Mr. Frankau, has distinguished himself in two wars, is now knighted for his services in the development of the sulphonamide drugs. The same combination of enterprise and patience that enabled him to recognise the therapeutic properties of sulphapyridine underlies his success in other fields, including the development of the Army Blood Transfusion Service. Dr. Alfred Howitt, MP for Reading since 1931 and chairman of the Parliamentary Medical Group, is unfortunately retiring from the House of Commons, where he has been a valuable exponent of the medical attitude.

Further afield knighthoods are also given to Colonel A. M. Cudmore, consulting surgeon to Adelaide Hospital and president of the Medical Board of South Australia, and Dr. A. L. Mudaliyar, FRCOG, vice-chancellor of Madras University. In congratulating all the recipients of these tokens of real esteem we hopefully wish them a happier New Year.

TEACHING HOSPITALS

ELSEWHERE we announce the formation of an Association of Voluntary Teaching Hospitals of Great Britain. It is thought that a body with special knowledge of the particular problems of teaching hospitals will serve a useful purpose in any discussions or negotiations arising out of the report of the Goodenough Committee on medical schools.

DR. THOMAS FERGUSON, professor of public health in the University of Glasgow, DR. R. E. LANE, lecturer in factory hygiene in the University of Manchester, DR. A. B. STOKES, deputy medical superintendent of Mill Hill Emergency Hospital, and MR. R. WATSON-JONES, civilian consultant in orthopædics to the Royal Air Force, have been appointed by the Minister of Labour to the national advisory council he has set up under the Disabled Persons (Employment) Act.

INCIDENCE OF DIPHTHERIA.—In the House of Commons MR. WILLINK stated that according to returns received from all but a few local authorities in England and Wales, 2243 cases of diphtheria among immunised children were notified during the first half of this year, as against 6743 among non-immunised children. The number of deaths among immunised children was 16, compared with 368 among children not so protected.

[illegible] J. W. Hodgson, C. J. *Lancet*, 1944, ii, [illegible] C. R. *Brit. J. Surg.* [illegible] Abreu, A. L., Litch- [illegible] 1944, 13, 271.

Reconstruction

DENTISTRY OR STOMATOLOGY?

C. Bowdler Henry, MRCS, LDS

LECTURER IN ORAL SURGERY, ROYAL DENTAL HOSPITAL; STOMATOLOGIST, INVESTIGATION WING, METROPOLITAN EAR, NOSE AND THROAT HOSPITAL

Shall dentistry become a separate profession like architecture; or shall it be more closely integrated with medicine? In other words, shall it be autonomous or auxiliary? It cannot be both.

This question has become urgent now that an interim report has been received from the Teviot Committee which has been considering how to provide a satisfactory dental service for the whole community.[*]

THE SEPARATE TRAINING

In the origin of dental training and practice we can see certain features which still handicap progress.

In the first half of last century dental practice was chaotic. Charlatans imposed upon a gullible public, and the medical profession disdained those few of its members who engaged in the calling. Nevertheless there were two sets of reputable practitioners—one composed of qualified surgeons, and the other of craftsmen who had worked up from the mechanical laboratory to the dental surgery. Though they approached practice from opposite directions, both sets saw the need for reform. A small band of surgeons led by John Tomes founded the Odontological Society (1856), drew up a curriculum of dental study (1858), instituted the London School of Dental Surgery with its concomitant charity (1858–59), and successfully petitioned for Parliament to grant the Royal College of Surgeons (1843–59) "power to institute and hold examinations for the purpose of testing the fitness of persons to practise as dentists ... and to grant certificates of such fitness." This is the LDS RCS Eng., the first examination for which was held in 1860.

The object was to establish a course of education for dentists which would be exactly comparable with the medical curriculum in period of study and cultural level. It was to be different somewhat in kind from that required for membership of the Royal College of Surgeons, but not inferior in degree. To give effect to this, two-fifths of the medical curriculum was omitted and in place of the medical subjects purely dental subjects were inserted.

A HYBRID CURRICULUM

The curriculum was designed by a subcommittee of the Odontological Society, and all the members of this committee were surgeons [†] practising as dentists. But they had to include plate-making in the curriculum, not merely because the adaptation of artificial teeth was a form of treatment which it was necessary for every dentist to know, but also because they wished to leave no part of dentistry outside disciplinary control. Furthermore, there were political considerations. The Odontological Society had a rival in the newly founded College of Dentists, which aimed at making dentistry autonomous and made a strong appeal to the craftsmen. A desire to gain the widest possible support may have been one of the committee's reasons for including so much of dental mechanics in its course of study. Moreover, at this period, though the science was in its infancy, the craft of plate-making, which still involved the carving of artificial dentures out of solid blocks of ivory, was at a high level. In consequence, the curriculum of the Odontological Society as approved by the Royal College of Surgeons constituted a compromise between the infant science and the established craft.

So practical was this curriculum that it remains fundamentally the same today, and all subsequent dental degrees have been founded on it. But in 1944 we recognise that the importance of the science far outweighs the importance of the craft. In the science lies prevention: in the craft there is only reparation, which is the eternal treatment of end-results. It was doubtless expedient to unite the two in 1860, but the offspring of their union is a conflict which has grown steadily and is still with us.

In recent years the status of dental practitioners has been openly discussed and the discontent felt by many has found expression. So far as I know, however, no-one has exposed the underlying cause of the trouble, which is this hybrid curriculum. The founders of the dental curriculum meant it to be equal in degree to the medical curriculum; and different only in kind. The expense and the time occupied were the same, and diplomates in dentistry might reasonably expect to be held in the same esteem as diplomates in medicine. But the part can never be as important as the whole, and it would have been better if training for practice in the part had been made shorter and less expensive than training for practice in the whole.

THE DOUBLE QUALIFICATION

Encouragement to take the full medical qualification has always been given. Speaking some 20 years after the dental curriculum had been in operation, John Tomes, to whose foresight and initiative we owe the dental diploma which he himself largely planned, said:

> "My strong advocacy of special, must not be interpreted as indifference to medical qualifications. I would give every possible encouragement to the attainment of the latter, not, however, as a substitute for, but as a supplement to the dental degree. Educationally, the relations of the membership to the dental licence may be regarded in the same light as the relations of the fellowship to the membership are regarded. This view will indeed take effect in certain appointments. In many of our hospitals, although the membership of the College of Surgeons is a full qualification, the governing [illegible] llows of [illegible] ollege is [illegible] implies [illegible] Member- [illegible] date for [illegible] lition to the dental licence of his College."

But for the majority of dental students, while still in their student years, an addition of 6 months to the period of their dental studies, with a further 33 months afterwards for completing the medical course has not [illegible] e delay in [illegible] students, [illegible] late their professional examinations were insufficient to enable them to go forward with a medical course after qualifying dentally; indeed in the past they have had to spend time reverting even to biology or to the examination in general education if they wished to take a degree course.

Thus we find that dentistry as a profession is a narrow cul-de-sac, and most entrants appreciate this too late.

The need for some form of higher examination has been felt by the profession and attempts have been made to satisfy it. But in so far as these introduce specialism within a specialty they are doomed to failure. On the clinical side no degree short of full medical qualification can be regarded as adequate in breadth and depth of basic knowledge.

SEPARATE STOMATOLOGY FROM PROSTHETICS

How then can the practice of dentistry and the training of dental surgeons be altered for the better? In the department of the teeth the natural trend is towards the application of prophylaxis based on biological investigation, such as the influences of heredity and nutrition. For prophylactic measures to be successful, those who apply them should have as complete a basis of biological knowledge as is needed for any other department of prophylactic medicine. It would be best I think to recognise that the present practice of dentistry is out of date, and at least to separate the biological from the prosthetic side.

There are several good reasons for adopting this course. Morally, it is not right that he who condemns a patient to lose teeth should profit by the fitting of artificial substitutes. Ethically, it does not enhance professional status that a dental surgeon should be a party to the sale of goods over the counter—which is how the law regards the fitting of dentures. Most important, however, is the need to improve the state of health of the community, which demands that the causes of dental disease should be studied and measures for prevention, ranging from antenatal care onwards, sagaciously applied.

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To secure this improvement in dental health we need stomatologists—preferably men who have entered the dental sphere through the broad portal of medicine. I would not by any means exclude those who take a medical qualification after their training in dental surgery, but the approach through medicine certainly gives a man a broader view: he sees the dental structures in their natural place in the general field; he sees that the reactions of dental tissues are those which his knowledge of physiology and histology would lead him to expect; and his springboard for research is fixed more firmly than that of the man whose approach to these biological problems has been predominantly through the mechanical rather than the physiological laboratory.

If our goal is to produce many more men with this type of mind, then we must [illegible] their training. We must make the specialty of stomatology equal in every respect to the other specialties of medicine, and this can be done only by removing dental mechanics from the stomatological curriculum and placing adaptive dentistry in a separate category of practice, that of dental prosthetics.

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A SINGLE BASIC MEDICAL EDUCATION ?

In planning the nation's dental services the basis should be the stomatological department of the polyclinic or health centre—not the requirements of private practice, which must be secondary to public treatment. To increase the personnel, and get best advantage from the fully qualified, certain parts of treatment should be delegated to persons specially, but less expensively, trained. This entails the division of professional personnel into categories, and the following are suggested:

(*a*) Stomatologists.
(*b*) Dentists.
(*c*) Dental auxiliaries, such as:

Hygienists.	Radiographers.
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as consultants to the dentists,
hold such appointments as
; (2) heads of dental services
or dental branches of medical services in the Forces and similar Government services; (3) visiting dental surgeons (but styled stomatologists) to all hospitals; (4) heads of stomatological clinics; (5) professors, senior teachers and directors of studies and research in university schools of stomatology and dentistry.

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leave the trunk earlier; his qualifying examination would be broadly equivalent to the present LDS, but he would have to pay more attention to general and special physiology and pathology and (since all platemaking would be excluded) less attention to dental mechanics. Dental auxiliaries would branch off still earlier—the prosthetists probably sooner than the hygienists but perhaps at the same level as the radiographists.

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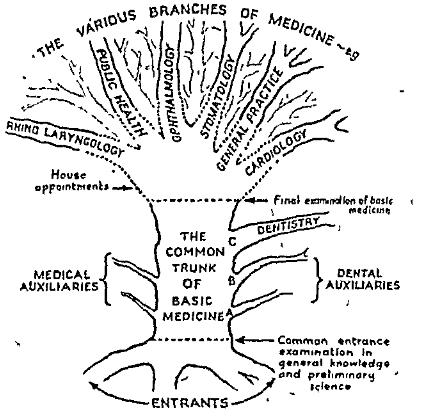
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The tree represents a trunk and branch system of a suggested scheme of medical education, in which student auxiliaries as well as those intending to proceed to full qualification take suitable parts of the same basic instruction and examinations. In this scheme stomatology, with dentistry and its auxiliaries, finds an appropriate location

A = dental auxiliary, e g Prosthetist.
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ascending the basic trunk: no-one should have to go back to the bottom and start again up some other trunk. For example, a dental auxiliary who left the main trunk at A, if he later wanted to become a dentist should be able to rejoin the trunk again at A and continue his basic studies from A to C. In the same way, a dentist who left at C should be able to convert himself into a stomatologist by rejoining the trunk at C and continuing his climb. Moreover, if a man who has chosen any of the dental branches—from stomatology to hygiene—desires to follow some other branch of medicine, he should be able to rejoin the trunk where he left it and go on with the appropriate courses of basic and special study.

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The examinations, from those of the basic education up to qualification, for every grade from auxiliary to medical or dental practitioner, would have to be identical throughout
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NUTRITION IN THE COLONIES.—Under the Colonial Development and Welfare Act, 1940, a free grant of £10,000 has been sanctioned to finance plans to deal with nutrition problems in the Colonies. The money will be spent on the payment of temporary technical staff, the training of staff, and the provision of technical equipment or materials required for experimental work.

Reconstruction

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But for the majority of dental students, while still in their student years, an addition of 6 months to the period of their dental studies, with a further 33 months afterwards for completing the medical course has not been practicable, because of the expense and the delay in becoming self-supporting. Furthermore, many students, lacking proper advice ab initio, have found too late their professional examinations were insufficient to enable them to go forward with a medical course after qualifying dentally; indeed in the past they have had to spend time reverting even to biology or to the examination in general education if they wished to take a degree course.

Thus we find that dentistry as a profession is a narrow cul-de-sac, and most entrants appreciate this too late.

The need for some form of higher examination has been felt by the profession and attempts have been made to satisfy it. But in so far as these introduce specialism within a specialty they are doomed to failure. On the *clinical side no degree short of full medical qualification can be regarded as adequate in breadth and depth of* basic knowledge.

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If our goal is to produce many more men with this type of mind, then we must facilitate their training. We must make the specialty of stomatology equal in every respect to the other specialties of medicine, and this can be done only by removing dental mechanics from the stomatological curriculum and placing adaptive dentistry in a separate category of practice, that of dental prosthetics.

The recommendations in the brief paragraph on dental health in the report of the Goodenough Committee [illegible] iere is no reference to [illegible] on Dentistry, over [illegible] npression left in the reader's mind is that so far as the Goodenough Committee is concerned, practice in the department of the teeth may still remain in the neutral zone of compromise in which the curriculum of 1860 originally placed it.

A SINGLE BASIC MEDICAL EDUCATION?

In planning the nation's dental services the basis should be the stomatological department of the polyclinic or health centre—not the requirements of private practice, which must be secondary to public treatment. To increase the personnel, and get best advantage from the fully qualified, certain parts of treatment should be delegated to persons specially, but less expensively, trained. This entails the division of professional personnel into categories, and the following are suggested:

(*a*) Stomatologists.
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Hygienists.	Radiographers.
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Prosthotists.	

Stomatologists would act as consultants to the dentists, and would invariably hold such appointments as (1) advisers to the Crown; (2) heads of dental services or dental branches of medical services in the Forces and similar Government services; (3) visiting dental surgeons (but [illegible]) to all hospitals; (4) heads of [illegible]; (5) professors, senior teachers [illegible] and research in university schools of stomatology and dentistry.

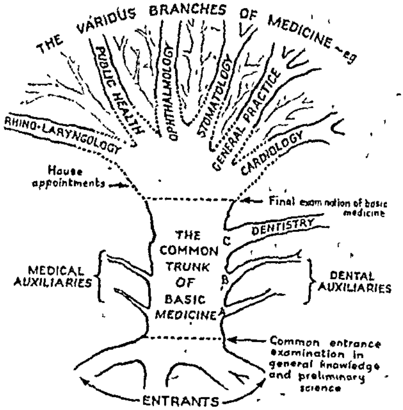
Dentists would carry out the ordinary operations of conservative dentistry—i.e., fillings, extractions, parodontal treatment and orthodontics—subject to the direction, though not necessarily continuous supervision, of the stomatologists. Several dentists could work under the supervisory control of one stomatologist.

In practice the dentists would fit between the stomatologists, to whom they would be subordinate, and the dental auxiliaries, to whom they would be superior.

Dental auxiliaries would carry out their duties under the direction of the stomatologists, with or without the interpolation of the dentists.

A "trunk and branch" system of training should be arranged, so that stomatologists, dentists and dental auxiliaries would receive appropriate parts of the same basic medical education. As stomatology is a specialty of medicine, the stomatologist would have to climb the whole trunk of basic medical study before getting on to his particular branch (see figure). The dentist would leave the trunk earlier; his qualifying examination would be *broadly* equivalent to the present LDS, but he would have to pay more attention to general and [illegible] athology and (since all plate- [illegible] led) less attention to dental [illegible] liaries would branch off still [illegible] probably sooner than the *hygienists* but perhaps at the same level as the radiographers and speech therapists.

An essential feature of this scheme is that the highest degrees of medicine should be available to every aspirant ascending the basic trunk: no-one should have to go back to the [illegible] p some other trunk. For exampl [illegible] left the main trunk at A, if he [illegible] a dentist should be able to rejoin the trunk again at A and continue his basic studies from A to C. In the same way, a dentist who left at C should be able to convert himself into a stomatologist by rejoining the trunk at C and continuing his climb. Moreover, if a man who has chosen any of the dental branches—from stomatology to hygiene—desires to follow some other branch of medicine, he should be able to rejoin the trunk where he left it and go on with the appropriate courses of basic and special study.


THE VARIOUS BRANCHES OF MEDICINE—eg
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A system of this kind would [illegible] people of [illegible] ones, and [illegible] it would [illegible] medical work. These possibilities of advance or exchange would do much to get rid of the dead-end atmosphere of dentistry and thus increase the number of entrants.

The examinations, from those of the basic education [illegible] General Medical Council. It would be essential for medicine to adopt a broader and more understanding attitude towards dental problems than hitherto. Will medicine accept the trust?

NUTRITION IN [illegible] ment and Welfar [illegible] sanctioned to fin [illegible] in the Colonies. The money will be spent on the payment of temporary technical staff, the training of staff, and the provision of technical equipment or materials required for experimental work.

Special Articles

THE TASKS OF UNRRA

FROM A CORRESPONDENT

A WISE old medical superintendent once said that it took two years to make a hospital from the time it was opened or reopened. However good the personnel were as individuals, it took this time for them to learn to work together—subconsciously, to know what was the business of each and which were the duties of others. If this is true of a small unit, how much more may it be true of a large body such as UNRRA? The agreement that brought this organisation into being was signed on Nov. 9, 1943, and the London office was opened only last March. What has it taken on? The provision of:

1. Essential consumer goods for immediate needs, such as food, fuel, clothing, shelter, medical supplies; and materials such as seeds, new materials, and machinery.
2. Essential services such as health and aid in repatriation of displaced persons; the rehabilitation of public utilities (light, water, communications) in so far as they could be restored for immediate needs and to enable a recipient country to produce and transport relief supplies for its own and other liberated territories; and assistance in procuring equipment for schools and universities.[1]

It is understood that, save in exceptional circumstances, UNRRA will take on these duties only in liberated countries. In ex-enemy countries after occupation they will be the function of the military authorities.

In these liberated countries its representatives will be subject to two limitations. First, "the agreement stipulates that the Director-General shall not undertake activities in any area in which the military are operating without the consent of the military command, and that he will be subject to such control as the command may find necessary."[2] Secondly, once a government has been set up in a liberated area, "the Administration would operate only after consultation with, and with the consent of, the government concerned."[3] This second provision is a logical conclusion of the aim of "helping the people to help themselves" which is the signal under which UNRRA has taken sail.

We live in a stricken world, whose recovery will be slow. At the moment we have to keep people alive; and that means food, clothing, fuel, and shelter, with the emphasis on the food. Now there are three things in the problem of food—its provision, its transport, and its distribution. The first two are useless without the third, and this demands the work of many, carriage, and a constant supply. There may be danger of loss between the port of unloading and the mouths of the peasant or the working man. We must face facts, and it would be a grave waste for food to be transported across the Atlantic and unshipped at a European port only to disappear into the black market.

So UNRRA reserves to itself the right if necessary to distribute the relief supplies.

> "Dean Acheson, Chairman of the Council, remarked that UNRRA could not reconstruct the world, neither could it be limited to a mere 'soup-kitchen' charity. The scope of UNRRA, he pointed out, lay somewhere between these two extremes."

This is a true saying; but the soup-kitchen must come first. Without calories to keep their muscles going, the provision of seeds and machinery will be of small avail; and medical supplies can do but little against disease in a starving population.

The other problem that UNRRA has set itself is the restoration to their own homes of all those persons who have been displaced from them. The task is immense. UNRRA is arranging to undertake it both in enemy countries and in those the enemy have overrun and conquered. Nearly all these many people will wish to return on the moment the bugles sing truce, and will shortly be screaming at the "inefficiency" that has frustrated their desire. But alas! it is impossible. The job will take time. And during that time the displaced persons will need food, clothing, and temporary shelter; with which arise medical problems at the present site of habitation, on the journey, and on arrival at the old home. Not least of these will be the mental one; and of that not the least part will be the need to keep them occupied in mind and body, doing their own share for the restoration of the world, without feeling that they are still subjected to the slave labour for which they were originally uprooted.

It may be that UNRRA is not moving quick enough, but immediate returns are hard to produce in so vast a scheme. It may be that we shall shortly see a great acceleration; and this is needed, for many are starving. It is unjust to judge the organisation for lack of results at this moment. But men and women will go on starving until results are obtained.

MEDICINE AND THE LAW

Criticism of a Coroner

A WRITER, said Fitzgerald, J. (in R. *v.* Sullivan, 1868), may freely criticise the proceedings of courts and of individual judges—"nay, he is invited to do so in a free, fair, and liberal spirit"—but he must write without malignity and he must not impute corrupt or malicious motive. The same distinction was made in 1928, in *R. v. Editor of the New Statesman, between legitimate* criticism and such an imputation of unfairness as would justify the court in committing the author for contempt. In a recent libel action at Manchester assizes a coroner complained that a newspaper had gone on to the wrong side of the line; the court, however, took the opposite view and dismissed the coroner's claim with costs.

Somebody, it appeared, wrote to the *Stockport Advertiser* a letter recounting a visit to a Stockport inquest. "If what I witnessed was an example of the manner in which such inquiries are conducted, it is high time that some public protest was raised; a coroner's inquiry is surely an inquiry to determine cause of death and not an inquisition; our British judicature and legal profession are known for the inherent quality of courtesy and fairness." Mr. J. A. K. Ferns, the coroner who was thus attacked, contended that this imputed discourtesy and unfairness to him and insinuated that he ought to be removed from his office; it also exposed him to public ridicule. The newspaper pleaded that what was written was not defamatory but was fair comment on a matter of public interest. Having given evidence in support of his claim, Mr. Ferns was cross-examined with a view to establishing what he stoutly denied—namely, that he had been ill-tempered to a witness, had shouted aggressively at her, and had told her not to mislead the court. There were other witnesses for the plaintiff. One, a former coroner's officer, said he heard no shouting, but in cross-examination seemed to agree that the coroner's manner had been slightly different since the letter was published. Another, a detective officer, denied warning a prospective witness that the coroner was a very peculiar man before whom witnesses must be careful. A third, the caretaker at the public-assistance office, denied that there had been any shouting or bullying. When the plaintiff's case was closed, the judge declined to accept the suggestion made by defendants that there was no libel. The witnesses for the defence were a girl who complained of the treatment she had received when giving her evidence at the inquest, two others who gave evidence on the same occasion, the writer of the letter, a reporter on the defendant newspaper's staff, and the assistant editor who had seen the letter-writer before publishing the letter and had formed a good opinion of his sincerity.

Mr. Justice Stable, who found for the defence, said it was clear that the plaintiff's manner made an unfortunate impression upon people at the inquest. If comment was honest, and not a cloak for private spite or grudge, it was a good thing that people occupying public positions should be exposed to public criticism. The letter was fair comment. "Let me make it plain," added the judge, "that the dismissal of the plaintiff's suit does not mean that Mr. Ferns is not perfectly well qualified to hold his office or that he has not discharged his duties quite adequately for many years or that he is unfit to continue doing so. Many of us would no doubt benefit from a little candid criticism from outside." Mr. Ferns, said the judge, must not take the matter unduly to heart. "After nearly 40 years as coroner

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[1] UNRRA. The Story of the United Nations Relief and Rehabilitation Administration. HM Stationery Office. 4*d.*

[2] *Ibid*, p. 5. [3] *Ibid*, p. 9. [4] *Ibid*, p. 8.

I am not surprised that Mr Ferns should get a little testy [illegible] he had only six years and I get [illegible] Thus the matter ended with hon[illegible] plaintiff failed to establish that the letter went as far as to suggest that he ought to be removed from office; short of that, the writer, if honest in his criticism, had a free hand.

NEW RUSSIAN MEDICAL ACADEMY

The new Academy of Medical Sciences of the USSR has lately held its inaugural meeting in Moscow. Georgi Miterev, People's Commissar for Health, addressing the meeting, said that the increasing differentiation of medical research had necessitated the creation of this coordinating centre. The immediate task of the Academy will be to study methods of preventing infectious disease, promoting the healing of wounds and combating wound shock. General Nikolai Burdenko, surgeon in chief of the Red Army, has been elected president of the Academy; the vice-presidents are Alexei [illegible] (pathologist), Mikhail Malinovsky (gynecologist) and Pyotr Kuptianov (surgeon); and the secretary Vasili [illegible] (physiologist). The presidium consists of Alexander Bogomoletz, Hippolyte Davidovsky, Julian Dzhanelidze, and Leon Orbeli. The Academy at present has 60 members, but a further number, as well as some corresponding members, are soon to be elected.

NEW YEAR HONOURS

The honours list issued on Jan. 1 contains the following names of members of the medical profession.

Baronet

Sir Alfred Edward Webb-Johnson, KCVO, CBE, DSO, MB MANC., FRCS

KCB (Military)

Air Marshal Sir Harold Edward Whittingham, KBE, MB GLASG., LL D, KHP, RAF

Knights Bachelor

Colonel Arthur Murray Cudmore, MC, MB ADELAIDE, FRCS
President of the Medical Board of the State of South Australia
Claude Howard Stanley Frankau, CBE, DSO, MS LOND., FRCS
Director of EMS, London and Home Counties
Alfred Bakewell Howitt, CVO, MD CAMB.
MP for Reading since 1931
Brigadier Lionel Ernest Howard Whitby, CVO, MC, MD CAMB., FRCP
Assistant pathologist to the Middlesex Hospital
Diwan Bahadur Arcot Lakshmanaswami Mudaliyar, MD MADRAS, LL D, D SC, FRCOG
Vice-chancellor of the University of Madras

CB (Military)

Brigadier William Ross Stewart, CIE, MB EDIN., FRCSE, KHP, VHS, IMS
Major General David Turnbull Richardson, MC, MB EDIN., KHS, RAMC
Air Vice Marshal Andrew Grant, CBE, MB EDIN., KHS, RAF

CSI

Major General John Simson Stuart Martin, MB EDIN., KHS, IMS seconded IAMC
DDMS, central command, India

CMG

Henry Speldewinde de Boer, MC, MRCS
DMS, Uganda
[illegible] Francis Ellis, OBE, MRCS, RAMC retd
[illegible] Consulate General, Tangier

CIE

Major General William Calder Paton, MC, MB EDIN., FRCSE, IMS
Surgeon general with the government of Bengal
Brigadier Donald MacDonald Fraser, MB GLASG., IMS seconded to IAMC
Inspector of medical services, general headquarters, India
Rai Bahadur Tridib Nath Banarji
Principal, Prince of Wales Medical College, Patna, Bihar

CVO

Walter Graham Scott Brown, MD CAMB., FRCS

CBE (Military)

Surgeon Captain Thomas Benjamin Dixon, MRCS, KHP, RNVR retd
Brigadier John Struthers Fulton, MD EDIN., MRCP, RAMC TA
Group Captain Edward Cyril Henry Foreman, MRCS, RAF

CBE (Civil)

Mrs Mary Georgina Blacklock, MB BELF.
Lecturer, Liverpool School of Tropical Medicine
Hugh Ernest Griffiths, MS LOND., FRCS
Surgeon to the Albert Dock Hospital and founder of its fracture clinic and rehabilitation centre
Thomas Baillie Johnston, MD EDIN.
Sector hospital officer EMS London, professor of anatomy Guy's Hospital Medical School
James Rögnvald Learmonth, CH M GLASG., FRCSE
Surgical director, EMS, south eastern area of Scotland, and professor of surgery in the University of Edinburgh
Lieut. Colonel Alfred Alexander Webster Petrie, MD EDIN. and LOND., FRCP
[illegible] al

OBE (Military)

Surgeon Commander Thomas Francis Crean, FRCPI, RN
Surgeon Lieut. Commander Edward James Starbuck Woolley, MB LOND., RNVR
Colonel Joseph Alexander Bingham, MB GLASG., FRCSE, FRFPS, RAMC
Colonel William Loren Fennell, MD MANITOBA, MCPS, IMS
Lieut. Colonel Leslie Fletcher, MB GLASG., RAMC
Lieut. Colonel Ian Morison Orr, MD, CH M GLASG., FRCSE, RAMC
Lieut. Colonel James Elliot Snow, MRCS, RAMC
Colonel Thomas James Logan Thompson, MC, MB DUBL., RAMC
Group Captain James Frederick Sandow, MRCS, RAF
Wing Commander Richard White Bernard Ellis, MD CAMB., FRCP, RAFVR
Wing Commander [illegible]

OBE (Civil)

P[illegible]
I[illegible]
M[illegible]
I[illegible]
A[illegible]

MBE (Military)

Surgeon Lieutenant Malcolm John May, MRCS, RNVR
[illegible] RCPE, RNVR
[illegible] Edward Watson Hard[illegible] ELF, RAMC TA
Major [illegible]
Major [illegible]
Major [illegible]
[illegible] AMC
[illegible] RAFVR
[illegible] RCOG,

MBE (Civil)

Sharat Shashi Kundu, MB
Officiating civil surgeon, Manipur State, Assam
Ramiro Cauchi Inglott
DMO Malta
William Cecil Wigan, MRCS
For welfare services in Nyasaland

Kaisar-i-Hind Gold Medal

Perakathu Verghese Benjamin
Medical [illegible] Mission Tuberculosis Sana[illegible]
to [illegible]
Norma[illegible]
Su[illegible] Vellore, and lately doctor
in [illegible] Mission Hospital, Peshawar
Colonel H[illegible]
Inspec[illegible]
Lieut.-Colo[illegible]
Lately [illegible]

In England Now

A Running Commentary by Peripatetic Correspondents

IN Pongo-Pongo, a Pacific atoll, where a number of young Anglo-Saxons are marooned to pursue their celibate calling, there is one small school of thought that holds that, if sanity is to be retained, an occasional "drunk," "blind," or other period of anæsthetisation is obligatory. Some of this school carry out their view with cold-blooded forethought, others only after a struggle with the gods of civilisation, but they all point out that unbelievers become thin and lank, querulous and censorious. If one calls the agencies by which these periods of unconsciousness are obtained by those bad little words "gin" and "rum" there is something gross and unpleasant about this view, but if one called them, say, di-thio-hic-alcohols or gave them a formula with a lot of CHs lolling round in a circle with possibly an S trying to butt in from outside and a P or so in the wing, then the matter could be studied with interest. After all, among the lowlier Brethren of the Lamp, the deciduous trees stay blotto for half the year, the dormouse and the squirrel hibernate, and even that arch-priest of progress, Man, must spend anything from a quarter to a third of his life inert, asleep. True, the Bosun Bird never seems to sleep at all, but he dies young and serve him right. It's all very well for you people in England to look down your noses at this brutishness, but with you book-covers do not go mouldy in a week—even the vulcanite of one's tobacco pipe can grow a mould on Pongo-Pongo—nor are you for ever jeered at by the imprisoning surf. You have your varied interests and that delightful form of atavism, feminine companionship. Moreover, of course, you do—and I write especially to say I hope you did—go back with one accord, all of you, at a stated time, to a childlike and gastric world, to a spell of happy communism, to a day of early legend and song, when only that which is lovely in the past is remembered and the future promises to glow and grow in sunshine: in short, from this coral speck—curse it—go nostalgic hopes that you have all had a very happy Xmas. (As there are no Xmas cards on P-P, please imagine a Robin, rampant; a Xmas pudding plus holly, couchant; and a bottle of Bass, charmant.)

* * *

It was nice of THE LANCET to give us a round game in the Xmas number! Take 500 girls, pencils, and bits of paper and ask them the following questions: (1) *How long do you like to sleep?* Not, mark you, "How long do you usually sleep?"—a very different pair of pyjamas. (2) *Are you a heavy, light, or medium sleeper?* These words may mean different states to different people, nor am I convinced that the sleeper herself is a good judge of the question. (3) *Do you wake in the morning fresh or heavy?* This may depend on what preceded sleep, the state of the bowels, or whether the boy has written lately as well as the quality of the sleep. (4) *Do you ever dream?* Of course everybody dreams, as any "non-dreamer" can demonstrate if he puts a pad and pencil by his bed and conscientiously tries to jot down his transient memories of sleep—and does this for several months. "Do you ever dream?" is really asking, "Before or after being unconscious are you $\frac{1}{2}$ or $\frac{5}{8}$ or $\frac{7}{8}$ unconscious?" But to put these haphazard answers to ill-framed questions into the scientific apparatus of tables and subject them to statistical analysis is pure nonsense. You might just as well ask, "Which do you like best, Joad, mince-pies, or the smell of onions?" and draw weighty conclusions from the answers; nor is the result more impressive if you append a long bibliography including Mrs. Beeton, Middleton on Onions, and Joad on Joad. I once knew a man who kept tadpoles in a priceless Chinese vase and also a youth who made toffee in a valuable silicon flask in the lab. but this... It's like putting a cough-cure picture in a frame meant for an "old master," it's...

* * *

Trying to run a lab. in India is bad for the arteries. Last week I discovered that my assistant had suddenly decided to use double quantity of CSF for sugar estimations without making any corresponding change in the calculation. She was obviously surprised that I found this course of action strange; yet she must be intelligent, or she couldn't keep a sari from falling all over the floor in ungainly folds, as they seem to do when English girls try to wear them. I interviewed a havildar who had spent eight years in a biochemistry laboratory, and two years in a clinical side-room. Feeling rather ashamed at asking anything so simple, I said, "How do you estimate blood-urea?" After a [illegible] replied, "Estimation of urea in blood. [illegible] and acetic acid...." I stopped him [illegible] if he had done many, and was quite relieved when he said "No," and hinted that his activities in the clinical side-room had been limited to routine urine-testing. I was a bit discouraged by now, but I asked him what he had done in his eight years at the other lab. He said "Vitamins." When I tried to find out which vitamins, he didn't know. I asked what methods he had been using, and he quickly explained that "the doctors" knew what was going on, but he didn't. I pictured him plodding through his daily task for eight years and never once reasoning why; and I thought he perhaps typified one of the reasons why India isn't quite so ad-[illegible] America or England. The thoroughly [illegible] will give you the result which he [illegible]; the [illegible] native" Indian will give you no result: but the "educated" Indian, the stuff of which laboratory technicians are made, will give you the result which he thinks you want. In this moderately rational desire he is handicapped by an imperfect understanding of what you really do want, and if you suggest to him that you want a "true," answer he is most pained and thinks you quite unreasonable. Moralising a little, it would seem that intelligence and a keen desire to please are not enough; they must be combined with the ability to face discordant and unexpected facts, the "brute facts" of which our experience is built. This ability is an important part of the "scientific conscience," and until it becomes less exceptional in Indians they will never leave their phantasy-world of political formulæ to enter the sphere of common day.

* * *

Very rarely does it fall to my lot to enjoy the luxury of illness, but when the lower half of my alimentary canal spent a night behaving in that internecine fashion so characteristic of liberated countries I decided to re-establish law and order by spending the next morning in bed, and, for once in a while, to let my patients get well without interference.

Let me hasten to disabuse the minds [illegible] may fondly imagine that diurnal slee[illegible] and won in the heart of the country. It is years since I spent a morning at home and the experience is one that I am not anxious to repeat. The Treasure looked in at intervals to ask if there was anything I wanted. My daughter spent some time strapping a restless pony apparently in the front porch. My elder son devoted the morning to clattering up and down the hall in a pair of heavy boots, an activity which stimulated the dogs to bark. The Treasure, who likes music while she works, accompanies it on the voice, while my younger boy, not to be outdone, prefers endlessly, flatly, and inaccurately to intone the twice-times table. Meanwhile the telephone adds its quota of sound, and the raucous cries of my wife striving to communicate with the deaf gardener evoke a spirit of emulation in the goats.

Next time I lie up I shall do so in an iron-foundry. There is at least a steady sequence about the noises there which I should probably find soothing.

* * *

Recent discussion on postoperative retention of urine has centred on the relative merits of various drugs given by injection. In one hospital the problem seems to have been solved satisfactorily, even in cases of laminectomy, by the postoperative administration (by mouth) of the local brew of cider in doses of $\frac{1}{2}$–1 pint.

* * *

It had been a bad morning. The unhealthily hot and steamy atmosphere of the operating theatre was heavily charged with pent-up emotion. The tonsillar fossa oozed. The tonsillar fossa went on oozing. The surgeon demanded viper venom, a new commodity in those days. A junior nurse retired to the fresher atmosphere of the store room.... Minutes passed and the fossa went on oozing. Says the surgeon to the theatre sister, "How do you expect me to stop this fossa bleeding if your nurses can't even find a simple bottle of viper venom?" He said more than that actually. Says the sister promptly, "Try spitting into it." The junior nurse returned, empty handed and apprehensive, to find the theatre atmosphere merely pleasantly hot and steamy.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICAL [illegible]

THE last three days of parliamentary work before the Christmas recess were inevitably dominated by the serious military situation on the Western front and by the events in Greece. Both have increased the strain on our resources, and because of the growing strain our mobilisation for war effort has been intensified.

The announcement of a new call-up of a quarter of a million men, to be obtained partly from civil life and partly by a comb-out of static units in the Army and from the Navy and Air Force emphasises the need, while another announcement, that ATS are to be sent abroad in considerable numbers underlines the effort now required. For the ATS are to be sent to release men for combatant duties. Unmarried women of 21 and over are to be posted in the same way as men, with due regard to the case of those with young children and other special circumstances [illegible] women of 19 years and over will be accepted as volunteers. The Secretary of State for War, Sir James Grigg, said he was confident that this Government decision would be welcomed as a necessary and expansive deployment of available resources. ATS will not be posted, either compulsorily or as volunteers, to Burma or West Africa, and only volunteers will be sent to India.

It is however in these Eastern theatres, as Lord Munster's report shows clearly, that women have a great part to play. The 250 VAD nurses who volunteered for service in India have now been distributed to 20 combined field base hospitals where they are nursing both British and Indian wounded, and both doctors and matrons would welcome an increase in their numbers. The ATS to be sent to India will no doubt play, in their own sphere, an equally effective part. And Lord Munster wants to send out from this country to India a large number of women willing to help in the work of the Red Cross and St. John, Toc H, the Salvation Army, the YWCA, and similar organisations.

Lord Munster's report includes a page on the medical services. [illegible] heavy, as i[illegible] and a great [illegible] less while men have to be kept in these unhealthy tropical conditions over a period of years. Malaria, dysentery, and typhus are rife in the Assam-Burma area. Medical services are said to be maintained at a high standard of efficiency, but there are shortages of medical equipment, including refrigerators, fans, and fly-proof netting. Lord Munster achieves a classic understatement when he says apropos of complaints of insufficient and bad-quality food in hospitals—that "Indian cooks . . . unless constantly watched are likely to depart from the [illegible] hygiene." Shortage of medical [illegible] of surgeons and trained nurses, [illegible] angements made by the Souttar [illegible] t to India last year which led to a great increase of Indian medical personnel.

But the strain on medical resources is not confined to India. One way to relieve it is to bring the war against Germany to a victorious conclusion at an early date, and even after that event the demand for the services of doctors for relief work will be considerable. We may however hope that a large proportion of the medical personnel needed in Europe will be provided by the European countries themselves. Some of them perhaps could help us by lending their doctors to the Allied Forces still in combat in other parts of the world.

In anticipation of the new world to come and the probability of an early election the House passed the second reading of the Representation of the People Bill which deals with future elections to Parliament. An Act enabling local elections to be held at early dates received the Royal Assent on the last day on which the House sat. So machinery to review local government authorities and the authority of Parliament itself by a general election will soon be in gear.

FROM THE PRESS GALLERY

Welfare of British Forces in the Far East

IN the House of Commons on Dec. 20 Mr. CHURCHILL said that Lord Munster, who had recently made a tour of India and the Burma Front, had prepared a report which was being issued as a white-paper. A great deal had been done to improve and expand welfare facilities for the British Forces, but clearly more could be achieved if additional resources and personnel could be provided from outside India. The Government would apply themselves energetically to that problem. Their first concern was, naturally, the welfare of the sick and wounded. Lord Munster had visited 34 hospitals and, from a layman's point of view, he was satisfied that the medical facilities were maintained at a high standard of efficiency despite the administrative difficulties of an extended front and poor communications. Lord Munster had drawn attention to certain shortages of medical personnel in India. Every effort was being made to improve the position, but the Government had to pay regard to the many other claims, both civilian and Service, on the available supply of doctors and nurses [illegible] Lord Munster's [illegible] irther members [illegible] be sent out to India. In some directions, said Mr. Churchill, it would not be possible to achieve what was desired until the defeat of Germany enabled greater resources to be diverted to the East. But plans had been made so that when these resources became available they could be diverted without loss of time to the amelioration of the conditions of service of the men and women of the Forces and the Merchant Navy who were called upon to continue to fight against Japan. Special attention was being given to the provision of a varied diet and up-to-date hygienic systems of preparing and cooking food.

QUESTION TIME

Expenditure on Medical Research

SIR E. GRAHAM-LITTLE asked the Lord President of the Council whether he could give any estimate of current annual expenditure on all branches of medical research in this country, including expenditure by Government establishments, including Service and Supply departments and the [illegible] involved in the promotion of health and prevention of disease; and what approximate proportion of such research was financed or controlled directly by the Medical Research Council.—Mr. C. ATTLEE replied: It is not possible to give any comprehensive estimate of current annual expenditure on medical research in this country, as investigations in this broad field of inquiry are financed not only out of public moneys but also by private funds administered by universities and hospitals and by independent research institutes and organisations. No complete information is available about these latter resources, and only a relatively small part of the total expenditure from funds of private origin is controlled by the Medical Research Council. As regards public funds, the main item is the expenditure of the Medical Research Council, amounting to about £290,000 in the current financial year; of this £250,000 is provided by the Parliamentary grant-in-aid and the remainder from contributions and repayments from various Government departments and sundry credits. The total expenditure directly allocated to medical research through other Government channels is at present about £100,000 per annum, mainly on special investigations by the Services into war problems. This takes no account, however, of research undertaken by the members of medical services, with the Armed Forces and otherwise, in addition to the other duties for which they are primarily employed; nor does it take account of research done by institutions in receipt of Government grants for mainly educational work.

Plans for Women Medical Students

Dr. EDITH SUMMERSKILL asked the Minister of Health whether he could now make a statement on the Goodenough report, including the admission of women students to medical schools.—Mr. H. WILLINK replied: I hope to be able to make a statement early in the New Year.

Advisory Council for the Employment of the Disabled

The MINISTER OF LABOUR announced that he had constituted his *National Advisory Council* under the Disabled Persons (Employment) Act, 1944, as follows:

Viscount Ridley (chairman).
Mr. W. P. Allen.
Lieut.-Colonel the Hon. J. J. Astor, MP.
Brigadier-General A. C. Baylay.
Mr. H. L. Bullock.
Major Sir Brunel Cohen.
Captain G. Crawshay.
Mr. A. Deakin.
Mr. E. De Ath.
Chief Commander E. L. Dixon.
Chief Petty Officer L. A. G. Faulkner.
Prof. T. Ferguson, MD.
Lieut.-Colonel H. Rivers Fletcher.
Mrs. M. K. Gaitside.
Councillor A. Gilzean.
Mr. I. J. Hayward.
Mr. R. A. Keys.
Dr. R. E. Lane.
Mr. W. A. Lee.
Dame Anne Loughlin.
Major J. C. Poole.
Squadron-Leader W. Simpson.
Chief Officer G. O. Snow, WRNS.
Major-General R. N. Stewart.
Dr. A. B. Stokes.
Lieut.-Commander G. W. Style.
Mr. C. G. A. Ward.
Mr. J. Watson.
Mr. R. Watson-Jones, FRCS.
Lieutenant the Hon. R. F. Wood.
Mr. R. E. Gomme, of the Ministry of Labour and National Service (secretary).

Maternity Accommodation

Mr. W. R. PERKINS asked the Minister whether he was aware that the management committee of the Cotswold Maternity Home, Tetbury, Gloucestershire, had decided to close the hospital owing to the shortage of staff, with the result that 16 maternity beds would be lost to the area and 38 patients who were due to go to this hospital during December and January would have to go to Cheltenham; what steps he had taken to prevent the closing of this hospital; and whether, in view of the industrial activity in the Stroud valleys, he would reconsider his refusal to allow a new maternity hospital to be opened near Stroud.—Mr. WILLINK: I was not previously aware that this maternity home was closing down. I am having urgent inquiries made in conjunction with the Minister of Labour and National Service. I think it better to secure the use of existing accommodation by providing necessary staff than to provide additional accommodation in which similar staffing difficulties would have to be met.

War-time Nurseries

Mr. H. MCNEIL asked the Minister if he was aware that a recent circular of the Ministry to welfare authorities anticipating the closing of many war-time nurseries and curtailing the recruitment and training of probationer nursery nurses had alarmed these authorities; and would he take steps to satisfy the widespread public demand for the continuance of those nurseries on a peace-time basis under post-war housing conditions and for the welfare of mothers and children, in the absence of any provision for home helps, even if the mother was not employed outside the home.—Mr. WILLINK replied: War-time nurseries have been provided at the cost of the Exchequer as an aid to war production. Their purpose has been to enable women with young children to help in the war effort and where these facilities are no longer required their continuance for this purpose at the cost of the Exchequer cannot be justified. I hope, however, that it will prove possible for a number of the war-time nurseries, where the site and the premises are suitable, to be taken over by local education authorities as nursery schools.

Health Services in Ethiopia

Mr. CREECH JONES asked the Secretary of State for Foreign Affairs if he was aware that the Society of Friends ambulance unit, which had been providing three-quarters of the medical personnel of Ethiopia, recently gave that government notice of its intention to withdraw because of the increasing difficulties of operation, shortage of drugs, funds, personnel and inefficiency in government administration; and whether, in view of the resignation or non-renewal of 13 of the 30 British subjects who accepted appointments in 1942 as advisers to the Ethiopian government, further steps were being taken by His Majesty's Government to help forward the health and development of Ethiopia.—Mr. A. EDEN replied: I understand that the Friends Ambulance Unit provides about half the European medical personnel at present in Ethiopia and that their intention (of which the Ethiopian government were fully aware) when they first arrived in Ethiopia at the end of 1942 was to remain in that country for one year only pending the organisation of Ethiopian medical services. The unit has now given its devoted services for twice that period, and I understand that the Society of riends now feel that they should be free to use it elsewhere. regards the health and development of Ethiopia, these are ters for the Ethiopian government. HM Government in the United Kingdom have, however, an obligation to assist the Ethiopian government in obtaining the services of British subjects whom they may wish to employ in a medical or any other capacity, and in the course of the negotiations for the replacement of the Treaty of 1942 HM Government have offered help calculated to promote the health and development of the country.

Repairs to Hearing-aids

Lieut.-Commander L. W. JOYNSON-HICKS asked the President of the Board of Trade whether he was aware that owing to the shortage of spare parts there was prolonged delay in repairing hearing-aids; and if he would release a greater quantity of an approved quality for civilian use.—Mr. E. H. DALTON replied: I regret that there have been delays in repairs, due in the first place to the heavy and increasing Service demands for valves, and in the second place to the fact that some manufacturers, contrary to the advice of the Board of Trade, have made new sets with valves needed for repairing old ones.—Lieut.-Commander JOYNSON-HICKS: Is anything being done to improve a situation which the Minister recognises is so bad?—Mr. DALTON: We are looking at it from every direction, but skilled labour is very short.

CANADA

(FROM OUR OWN CORRESPONDENT)

THERE were 350 applications for registration in the faculty of medicine of the University of Toronto this fall, and 150 were provisionally accepted. These will be subjected to an aptitude test, and low grading in this test is held to be an almost certain prediction of failure at some stage of the course. Such students are advised to enter on some other line of study.

A peripatetic correspondent in THE LANCET (Sept. [illegible]) protests against the idea that one man should have the authority to say who should or should not study medicine. Canadian universities have never been threatened by anything like this. Committees of faculty make the first selection, largely upon standing obtained in school examinations set by provincial departments of [illegible]. The revelations of the aptitude test are not be[illegible]. There is no opportunity for students rejected by the committees to display any aptitude they may have, which might conceivably be greater than that of other students chosen because of academic proficiency in high school.

Students of theology in many colleges are tested as to the validity of their "call" to preach. The aptitude test is the nearest approach we have to a means of selecting the "called" in medicine from those who have been deceived by some other noise. That being so it would seem desirable to apply it to the whole group of applicants, the final selection being made from the most promising candidates.

The large number of young people applying for registration in schools of medicine indicates that a medical career is at present very attractive. A qualified physician is almost sure of a good living and his wife enjoys social prestige. These attractions are likely to fade somewhat should the practice of medicine come under state control as is threatened all over Canada. Should this happen the selection of students will be simplified: the undesirables, however brilliant, will not apply.

The Principal of Queen's University in his annual report noted that after many years of exclusion women students have been admitted to the course of medicine. Two are in the first year and two with advanced standing are admitted to the second year. In Toronto 36 women have been given provisional registration in the first year, but many others have been rejected. Information is not available from other universities but there appears to be a definite trend towards the study of medicine by women. A Russian visitor expressed himself as amazed that the proportion of women to men in medical schools in Canada was so low. Dr. George Draper of New York spoke to the Royal College of Physicians and Surgeons a few months ago and suggested that the urge to study medicine was due to a preponderance of the gynic element in the androgynic mosaic of personality. Should that be so it is quite logical to argue that women, who must necessarily have such a type of personality are peculiarly suited to the practice of medicine.

Letters to the Editor

IN WHICH WE MIGHT SERVE

SIR,—You lately quoted with apparent approval, as though it were self-evident truth, a paragraph from a *Times* leader to the effect that the profession cannot expect a subst[illegible] and determining the forn[illegible] because the public will be [illegible] a year to doctors in this service. Self evident it may seem to the *Times* but surely, Sir, it should not seem so to you

The public pays much more than £[illegible] million a year for its naval service; but though the F[illegible] Lord is a civilian and Parliament holds the purse-strings I have always supposed that the administration of the Service was very largely in the hands of professional sailors, that the Board of Admiralty consisted mainly of admirals, and that it had powers far exceeding th[illegible] of the central advisory council proposed to assist the Minister of Health. When Parliament and the public have asserted their powers, overridden professional advice, and settled for themselves the kind of naval service they would like to have, as they did in the 1920's and early 30's, the results have been unfortunate not only for the Navy but for the country, and indeed for the world. But at other [illegible] are justly proud, and [illegible] are themselves [illegible]

[illegible], on the other hand, is run very much as is proposed for the medical service, not by teachers but by a Ministry and local authorities. It [illegible] vitally important of [illegible] ever to have heard [illegible] ess pride in it, or assert, as we do of so many of our institutions, that British State education is the finest in the world.

I believe myself that a people with a clear vision of its [illegible] good would think long before doing anything [illegible] the number of its citizens still able and willing [illegible] direct and undivided responsibility for the [illegible] undertake; but, without looking so deep or [illegible] d, is it not abundantly clear that if the public desires a medical service of which both they and those who serve in it can be justly proud, and in which sons will follow their fathers, they will be wise to take as their pattern not county-council schools but the Royal Navy?

Hampstead, NW3. LINDSEY W. BATTEN.

SIR,—With the greater part of your leading article of Dec. 16 I am in agreement. But you take the white-paper view that "executive powers of this kind can be vested only in elected representatives of the public." [illegible]

[illegible] the Air Council, a body [illegible] sional airmen, and a [illegible] no elected representa[illegible] cretary. Why can't [illegible] ase be run the same [illegible]

SERVING OFFICER.

[illegible] medical profession should have [illegible] new service, and an effective [illegible] But technical skill does not [illegible] he right to control services provided by the public for the public. Such services cannot be run by elected representatives of the medical profession, responsible only to the profession; for in a democracy control must ultimately rest with elected representatives of those who find the money—either [illegible] local authorities, centrally through [illegible] both. Doctors must of course take [illegible] stration of a medical service, just as [illegible] partment the technician is [illegible] and acts in his name.

In the Service Ministries the technician may seem to be able to take decisions and give orders more directly than in the Ministry [illegible] differences between [illegible] n this field. But t[illegible] is often imagined. In the Ministry of Health there is now a large medical department carrying on a great deal of day-to-day work into which the administrative officers do not normally enter, while for other purposes the doctors and administrators work side by side and the administrators take responsibility for decisions affecting the Ministry's public duties. The ultimate responsibility always remains, however, with the Minister, and his chief medical officers have as free and direct access to him as his chief administrative officers. This civilian system has advantages as well as disadvantages. As voluntary hospitals have shown, doctors can achieve excellent results through lay administrators provided both parties are working towards the same end; and under the present régime doctors at the Ministry of Health seldom complain of being frustrated by their lay colleagues. It would, no doubt, be constitutionally feasible to transfer the executive posts in the Ministry to doctors, but this would not mean that the profession was controlling the service. Also it would produce fresh problems; for the Ministry would still have to deal with the Treasury and Parliament, and doctors who have to devote much attention to governmental technique are apt to lose touch with the technique of medicine. A more useful change, in our view, would be to strengthen the medical staff of the Ministry by the addition of more part-time members engaged in active practice.

Emotionally, and in other ways, there is indeed a contrast between one of HM ships and the school or hospital of some backward local authority. Dr. Batten will remember, however, that the social services are only young and poor relations of the fighting services. The public educational and medical services were established mainly to fill, inexpensively, the larger gaps left by private enterprise and charity; and if the nation, declaring war on ignorance and disease, had granted several hundred millions a year to the Ministries of Education and Health, it would probably have secured something more spectacular. These Ministries have only just begun to plan their comprehensive services for the community, whereas the Admiralty, with almost unlimited resources in time of war, has been planning a comprehensive Navy since the days of Henry VIII.

The result of naval planning is superb. But it is also an entirely centralised, strongly disciplined, authoritarian, State salaried service, paying no attention to the opinions of the people on whom it operates, since they are the King's enemies. This, surely, is precisely what we must avoid for medicine.—ED. L.

AMŒBIASIS

SIR,—In the discussion on amœbiasis at the Royal Society of Tropical Medicine and Hygiene on Nov. 16, reported in THE LANCET of Dec. 9, Dr. A. R. D. Adams of the Liverpool School of Tropical Medicine and other speakers referred to what they call the "Liverpool" method of treatment. This treatment is as follows:

> The treatment lasts 21 days. Bismuth carbonate is given daily, 1 drachm three times a day, in water.
>
> *On odd days:* 'Auremetine' capsules, gr. 3, daily; chiniofon retention enema, daily.
>
> *On even days:* Tab. 'Stovarsol' 0·25 g. b.i.d.

In 1926 Sir Philip Manson-Bahr and I conceived the [illegible] ('Quinoxyl,' chiniofon) as a retention enema. My method of treatment was (and is) as follows:

> *On odd days:* one "slipule" of auremetine, gr. 1, three times daily to a total of 10 days.
>
> *On even days:* Tab. stovarsol, 0·25 g. three times a day to a total of 7 days (provided, always, that the patient does not show any intolerance to arsenic); chiniofon retention enema of one litre daily, the first two at 2½%, the last eight at 5%.

In the beginning, I used to give large doses of bismuth, either the subnitrate, as recommended by Deeks of Panama, or the oxycarbonate as practised by the Liverpool School. I have, however, of recent years given this up, as I do not think that it had much effect one way or the other.

Some time later—I think it was in the early summer of 1930—I outlined my treatment to the late Prof. Warrington Yorke (who was looking after our tropical cases at Liverpool) and I heard later he had adopted it as a standard treatment for amœbic dysentery. I think you will agree that, in essentials, the so-called "Liverpool" method differs little from the treatment used in this Ministry; and that if any name is to be attached to the treatment, it should be that of the Ministry of Pensions, in which I have had the honour to serve for many years.

Manson-Bahr and I seem to have obtained exactly similar results from the two methods of combined treatment, and I can unreservedly support his claim that, while an odd case here and there has relapsed, we have yet to meet a case that has not *responded* to the treatment, if it is given with meticulous attention to detail.

May I also correct the report of my remarks in your issue of Dec. 9? I am made to say that I had encountered numbers of intractable cases of amœbiasis. What I meant to imply was that I was encountering numbers of cases of amœbiasis which were resistant to emetine. Further, that I had tried a number of drugs to influence the concomitant bacterial infection. The only drug that I have found of any use in this connexion is penicillin. As to conessine. I mentioned, in reply to a question by Sir Harold Scott, that I had tried this alkaloid in a number of cases after the last war, but had found it to be without any effect whatever.

Queen Mary's (Roehampton) Hospital. J. GRAHAM WILLMORE.

TRANSFUSION ORGANISATION

SIR,—During the war I have had the opportunity of studying, in the Midland Region, the working of the national transfusion organisation set up by the Ministry of Health. as applied to many hospitals differing in administration and facilities. As a result I feel that more should be known of the well-regulated control maintained by the service over all transfusion fluids and equipment.

The only stable transfusion material is dried plasma. This, effectively sealed, can be stored indefinitely within normal extremes of temperature. In the case of blood, experience shows a maximum life of 14 days to be desirable. Correctly maintained storage conditions are imperative. A small refrigerator should be reserved specifically for blood storage. It is not sufficient to check the temperature from time to time, for variations are frequent. Refrigerators are therefore supplied with a maximum and minimum thermometer which is read and noted at each delivery and collection. At the same time a record of the numbers and condition of all unused blood is made; valuable information is thus afforded to both user and supplier. Permissible temperature variation is + 2° C to + 7° C. Outside this range a raised reaction rate is often encountered, particularly in winter with refrigerators in exposed sites. Sometimes heat is required to prevent temporary freezing, resulting in hæmolysis of the blood.

Liquid plasma, in general use in the early days of the Ministry of Health's service, suffers from major disadvantages, the principal being the inevitable deterioration with storage. Changes like formation of clots and development of granularity are greatly accelerated by low and variable temperatures. An ever-present danger is the chance of infection, also occurring with bottles of distilled water used for dried plasma reconstitution. Careful inspection of all bottles monthly against a strong light is the only satisfactory safeguard. It is dangerous to attempt to differentiate visibly between "granular" sterile and infected plasma; crystal clarity of both liquid plasma and distilled water is the criterion for use.

A routine for transfusion of blood at these hospitals has been established. Grouping of the patient is carried out, using a macroscopic technique with serum of high titre supplied by the central laboratory. The officer responsible then withdraws the appropriate bottle of blood from the bank and observes that the plasma-cell junction is clearly demarcated and that there is no trace of hæmolysis. Under no circumstances should blood be transfused if it shows haziness or an ill-defined layer. Some bacteria may proliferate even at 4° C. but fortunately hæmolysis is always concomitant; it is erefore essential that a competent person should examine the blood while it is undisturbed in the bank. The common practice of sending a nurse or student for a bottle of blood cannot be too strongly condemned. A cross-agglutination test of donor's cells with patient's serum must routinely be performed with macroscopic examination after 10 minutes at room temperature. Blood and plasma should be warmed to 37° C. before administration—serious consequences have often resulted from over-heating. Partly used bottles must never be retained for later use.

There has been much uncertainty as to the exact potentialities of blood and plasma. The danger of overloading should at all times be stressed. In cases where transfusion is necessary the amount should be judged from the [illegible] ondition and blood pressure, and [illegible] and biochemic estimations, and [illegible] ilarly be assessed.

Careful records of all transfusion data may reveal weak features in technique both at the hospital and the central laboratory. The [illegible] of [illegible] appear to be giving blood [illegible] pyrogens. A useful rate, other than for massive [illegible] 40 drops per minute, particularly where [illegible] is being employed. It is unwise for hospitals to re-sterilise transfusion equipment; reactions have ofte been due to this.

Regular contact with the officers of the service enables the hospital transfusion officer to obtain advi [illegible] technique and procedure and discuss advances in [illegible] fusion work. In this way the full implications [illegible] Rh factor have been impressed on transfusion officers and arrangements made for typing and securing Rh-negative blood on special demand from the central station. Investigational and follow-up work on jaundice reactions is also a recent result of this liaison.

My experience brings out two prime needs—that at all hospitals a particular officer must be [illegible] for transfusion arrangements; and that whe [illegible] transfusions should be planned procedures.

Birmingham. HAROLD THWAITE.

MALIGNANT MELANOMA

SIR,—When I saw the gruesome illustrations and alarming title of Miss Tod's paper I knew that we had to expect anxious inquiries from patients with moles on their skin. The paper attracted the attention [illegible] popular newspapers sufficiently for them to publish warnings of the dangers foretold from these blemishes. and it is regrettable that at least equal publicity was not given to the just and commendable criticism by J. E. M. Wigley and R. T. Brain (Nov. 25) which contains evidence that is less inaccurate and certainly more desirable for the public.

Miss Tod's paper attracted attention with the news that a common blemish could by a common treatment be converted into a malignant condition, horrible in appearance and outlook; yet it did not make any real contribution to its successful treatment. Though moles are very common, and malignant melanoma very uncommon, the latter do not all originate in pigmented moles. The primary focus of malignant melanoma may originate at a site without a pre-existing mole; it may not show the pigment; it may be related by the patient to a small wound; and its appearance may not disturb the patient or suggest to the surgeon the grave lesion which calls for drastic surgery. The first indication of its gravity may be the appearance, in the subcutaneous tissues some distance from the primary focus, of one or more small dark spots which may resemble tattoo spots in their seemingly harmless character; for there may be no elevation of the skin over them, and no sign [illegible] in the tissues around. Yet even at this stage [illegible] X-radiation appears to be useless, even when i [illegible] to or beyond the limits of skin tolerance, and surgery of the boldest does not appear to be any more successful. I have seen cases in which X-radiation has been the main cause of pain and distress. On the other hand, pigmented moles may exhibit very ugly and suspicious appearances, may have shown evidence of much recent growth, and may have histological features which suggest malignancy, but may yet be cured by local surgical excision.

Even the suggestion that trauma can convert a [illegible] mented mole into a malignant melanoma has not bee established. A common site for moles is the beard are here they may be repeatedly and frequently cut with the razor over a period of 10 or more years without producing a malignant melanoma.

When our cancer "experts" can tell us of a cure let [illegible] "the horrors in quotable [illegible] un[illegible], but until then let it contributes nothing. [illegible] adds alarm where apprehension already exists.

Edgbaston, Birmingham. JAMES F. BRAILSFORD.

SIR,—Miss Margaret Tod's article was strongly criticised by Dr. Wigley and Dr. Brain. Apart from the statistical and sociological considerations there are two points on which I would like to disagree with the critics.

They do not admit that irradiation offers a useful alternative to surgery, accepting the generally held view that malignant melanomata are not radiosensitive. There is no doubt that many, perhaps the majority, are radiosensitive. In 1937 I developed this thesis in a paper subsequently published in the British Journal of Radiology (1939, 12, 327). In the literature there are many cases of undoubted radiosensitivity of such tumours. After three years' radiotherapy I was convinced in 1933 that the generalisation was incorrect [illegible] seen complete disappearance of malignant [illegible] radiation. In trying to analyse the [illegible] I came to the conclusion that inefficient removal and inefficient radiation could both be associated with subsequent invasion by the neoplasm, along the well-known routes and especially in the skin. Infection and interference with nutrition of even small groups of cells may be factors of very great importance.

Miss Tod's figures show the danger to the patient of inadequate treatment in the first instance, and also show that radiation can be effective.

Whether the malignancy of such tumours can be the result of injury or injudicious treatment is a question which can never be settled, but "a simple excision or one or two applications of carbon-dioxide snow," although not carcinogenic factors, are dangerous in some cases, the malignancy of which may have been unrecognised, and even unrecognisable, without histological [illegible] in my own experience I can say that [illegible] is safe if combined with radiation, [illegible] fixed inoperable lymph-glands can be [illegible] in some cases by radiation. [illegible] that overdosage of malignant [illegible] produce marked skin changes [illegible] cause of failure to treat success-

[illegible] Radiotherapy Dept., London Hospital, E1. FRANK ELLIS.

PLACE OF IODINE IN THYROID MEDICATION

SIR,—The Goitre Subcommittee of the Medical Council have summarised the evidence in [illegible] giving iodine to prevent the type of goitre [illegible] with iodine deficiency, and have urged the [illegible] national policy of iodisation of all common [illegible] prevention of simple goitre (*Lancet*, 1944, i, [illegible] consensus of medical opinion is against the [illegible] of iodine in therapeutic dosage once the [illegible] become enlarged, because it hardens the [illegible] information is conflicting about the possible therapeutic value of smaller doses over a considerable period.

To obtain information on this point, an investigation was made in two factories (A and B) employing women recruited from the same area. The factories were adjacent but separate: they were under the same medical supervision; and the age-incidence of the employees was similar. The iodine content of the drinking waters used by these women is low and lies between 2·5 and 3·2 μg. per litre.

The incidence of thyroid enlargement among 1276 women examined was:

Factory	Number examined	Number with enlarged thyroid	Case-rate %
A	800	86	10·8
B	476	33	6·9
Total, ..	1276	119	9·3

In factory A 83 women, and in factory B 33 women, were enrolled in the experiment as treated and control groups respectively. The women under treatment (factory A) received twice weekly one tablet containing ⅛ grain of potassium iodide. The tablets were distributed by the welfare supervisor directly to each worker. There was a transfer of women labour to factories in other parts of the country but at the end of six months (February to August, 1944), 46 remained in the treated group and 29 in the untreated. The alterations in the size of the thyroid during the experimental period were:

Factory	Increase	No increase	Decrease	Total
A (treated) ..	21	7	18	46
B (control) ..	15	7	7	29

The appropriate statistical test was kindly made by Mr. W. T. Russell, D.SC., to ascertain if the two distributions were different, and it was found that the value of χ^2 was 2·10 and $P = 0·36$, which indicates that the progress of the disease among women in the two groups was not dissimilar.

The results of this experiment suggest that the place of iodine in thyroid medication is prophylactic, before the thyroid gland enlarges, in areas where the iodine content of the water-supply is known to be low and goitre occurs. They also bear out the view that the amount of potassium iodide given has no adverse effects, and hence indicate that the use of iodised salt as recommended by the Goitre Subcommittee could have no adverse effects either.

Gloucester Aircraft Factory. R. WILSON CAREY, Medical Officer.

DECISIONS IN WAR-TIME

SIR,—In the debate on the Address, reported in your last issue, the Deputy Prime Minister deprecated the holding at the present time of the election of 30 members of the General Medical Council, 7 of whom only are elected by medical practitioners, on the grounds that "the medical electorate numbers somewhere about 65,000. The strain on the medical profession at the present time is immense. The fact is that people do not know where a large proportion of those 65,000 members are. A large proportion of them is overseas. A great many of the other doctors have been moved about the country according to the exigencies of war." Dr. Russell Thomas very usefully directed the attention of the House to the Deputy Prime Minister's argument against present changes affecting doctors and declared that "the rt. hon. gentleman on behalf of the Government has made it perfectly clear that the medical pro- [illegible]

[illegible] ster and the Government, who propose to introduce legislation revolutionising medical practice in defiance of the clear undertaking given by the Prime Minister himself in the House on Oct. 13, 1943, in the following explicit terms:—

[illegible]

> making far-reaching controversial changes which I am not convinced are directly needed for the war effort, without a Parliament refreshed by contact with the electorate."

House of Commons. E. GRAHAM-LITTLE.

SMALLPOX AND VACCINATION

SIR,—I should like to reply on behalf of Major Illingworth and myself to the criticisms levelled at our paper (Nov. 25) by Dr. J. P. Marsden.

The paper was not written for experts; neither of us can claim experience in any way approaching that of Dr. Marsden. It was written for the benefit of the many RAMC medical officers who may run up against

University of Liverpool

At recent examinations the following were successful:

MD—W. I. D. Scott.

FINAL EXAMINATION FOR MB, CH B

Edith M. Brown and D. A. Gregson (with second-class honours).

Part III.—M. K. Alexander, J. T. D. Allen, E. T. Anderton, H. B. Andrews, E. H. Annels, J. P. D. Bates, T. J. Boag, E. Cooper, D. Craddock, H. T. Davenport, K. R. Dumbell, E. D. Edmondson, [illegible] C. Frew, A. Griffith, J. E. Hall, D. A. [illegible] G. Hughes, L. Jacobs, E. S. Jones, H. A. [illegible] T. W. Lawson, S. Lipton, J. B. Lynch, K. McCarthy, M. G. McEntegart, R. H. Martlew, Lucille F. Morgan, D. B. Mossman, C. M. Ogilvie, C. A. Pearson, H. H. Pilling, W. L. Sanders, Isabel S. Smellie, G. W. Storey, P. J. Taylor, W. A. Thompson, and R. D. B. Williams.

Royal College of Surgeons of Edinburgh

At a meeting of the college on Dec. 19, with Prof. R. W. Johnstone, the president, in the chair, the following were admitted to the fellowship:

R. S. Barclay, MD [illegible] MD DUBL, R. B. W. Cole, MB DURH., Le[illegible] G. Hargrove, MB CAMB., L. [illegible] MRCS, F. J. Lorriman, MD [illegible]tchell, MB BIRM., D. R. K. Reid, MB ST. AN[illegible], [illegible] MRCS.

British Dental Association

Sir Alfred Webb-Johnson, FRCS, will open the inaugural meeting of the industrial dental officers' division at 13, Hill Street, London, W1, on Saturday, Jan. 13, at 2.30 PM. Speakers will include Dr. R. V. Bradlaw, professor of dental surgery in the University of Durham.

Priority Rations for Invalids

The Ministry of Food is sending every doctor a copy of its new booklet, MED 2, on special rations and allowances for invalids and people on special diets. Extra copies may be obtained from the Ministry's Welfare (Foods) Branch, Mount Stewart Hotel, Colwyn Bay.

Dried Bananas for Adults

Patients with steatorrhœa can now obtain up to 14 lb. of dried bananas a month by applying to their local food office and presenting proof that steatorrhœa is present, including an analysis of the stools for fat.

St. Thomas's Hospital

The medical school has left its temporary premises at Godalming and will reopen in the London building on Jan. 9. The linked St. Thomas's Hospital at Hydestile will continue to cater for most of the inpatient clerking and dressing.

Hygienists for the Continent

The Civil Affairs branch of the Army is asking for the services of a number of medical officers of health to act as hygienists in liberated areas.

Society of Thoracic Surgeons of Great Britain and Ireland

The society will meet in London on Thursday and Friday, Jan. 25 and 26. At 2 PM, on Jan. 25, at 1, Wimpole Street, W1, there will be discussions on constrictive pericarditis, and foreign bodies in the air-passages, and at 10 AM, on Jan. 26, at 26, Portland Place, W1, a discussion on treatment of carcinoma of the bronchus.

The Place of Science in Industry

The British Association, through its division for the social and international relations of science, is arranging a conference on this subject, to be held at the Royal Institution, Albemarle Street, London W1, on Friday and Saturday, Jan. 12 and 13. There will be discussions on what industry owes to science, on fundamental research in relation to industry, on industrial research and development, and on what science might accomplish in the future. The speakers will include Prof. E. C. Dodds, FRCP, FRS, Prof. J. M. Mackintosh, FRCP, Sir Richard Gregory, FRS, Mr. A. L. Bacharach, Sir Joseph Barcroft, FRS.

Association of Voluntary Teaching Hospitals of Great Britain

A meeting of nominated representatives of the undergraduate teaching hospitals was held at the Westminster Hospital on Dec. 7. The 46 present included Dr. H. E. A. Boldero, Dr. W. Russell Brain, Dr. E. ff. Creed, Mr. W. D. Doherty, Dr. F. G. Hobson, Dr. Hugh Gordon, Prof. T. B. Johnston, Mr. G. H. Macnab, Dr. E. F. Scowen, Dr. G. Cochrane Shanks, Mr. Fauset Welsh, and Mr. J. M. Wyatt. The chairman of the association is Mr. J. E. Humphery, airman of Guy's Hospital, and Mr. B. Lees Read (Guy's ospital) and Mr. F. J. Cable (Manchester Royal Infirmary) ve been nominated as secretaries.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED DEC. 16

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 1 scarlet fever, 1990; whooping-cough, 1343; diphtheria, 463; [illegible] typhoid, 7; measles (excluding rubella [illegible] (primary or influenzal), 72[illegible] puerpe[illegible]rebrospinal fever, 37; poliomyelitis, 5; polio-encephalitis, 0; encephalitis lethargica, 1; dysentery, 201; ophthalmia neonatorum, 76 No case of cholera, plague, or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Dec. 13 was 870. During the previous week the following cases were admitted: scarlet fever, 32, diphtheria, 22; measles, 43; whooping-cough, 19.

Deaths.—In 126 great towns there were no deaths from enteric fever, 7 (0) from measles, 2 (0) from scarlet fever, 3 (0) from whooping-cough, 7 (0) from diphtheria, 32 (4) from diarrhœa and enteritis under two years, and 21 (1) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 224 (corresponding to a rate of 32 per thousand total births), including 13 in London.

WEEK ENDED DEC. 23

Notifications.—The following cases of [illegible] were notified during the week: smal[illegible] fever, 1906; [illegible] 1317; diphtheria, 456; paratyphoid, [illegible] 2; measles (excluding rubella), 8433; pneumonia (primary or influenzal), 715; puerperal py[illegible] fever, 33; poliomyelitis, 5; [illegible]ncephalitis lethargica, 1; dysentery, 173; ophthalmia neonatorum, 53. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Dec. 20 was 903. During the previous week the following cases were admitted: scarlet fever, 50; diphtheria, 30; measles, 61; whooping-cough, 14.

Deaths.—In 126 great towns there were no deaths from enteric fever, 13 (0) from measles, 3 (1) from scarlet fever, 10 (0) from whooping-cough, 5 (0) from diphtheria, 52 (3) from diarrhœa and enteritis under two years, and 28 (4) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 202 (corresponding to a rate of 29 per thousand total births), including 20 in London.

Births, Marriages, and Deaths

BIRTHS

BLAXTER.—On Dec. 23, in London, the wife of Lieutenant P. L Blaxter, RAMC—a daughter.

BONEY.—On Dec. 28, in London, the wife of Lieut.-Colonel T. Knowles Boney, RAMC—a son.

HAM[illegible] John Hamilton, [illegible]

HYL[illegible] Lorna Hylton [illegible]—a daughter

MARRIAGES

HENDERSON—HART.—On Dec. 14, in London, John Anthony Henderson, surgeon lieutenant RNVR, to Barbara Joan Hart.

LOGAN—HOWELL.—On Nov. 22, at Liverpool, Robert Francis Lesli Logan, MB, MO to Netherlands ministry of shipping, to Bett Eugenie Howell, VAD, RN.

TOWNSEND—STONE.—On Dec. 28, in London, Wilfred Henr Townsend, surgeon lieutenant RNVR, to Elizabeth Patric Stone.

DEATHS

AYTOUN.—On Dec. 23, at Bridgwater, John Henry Aytoun, M[illegible] EDIN., formerly of Broadstairs and Lasswade.

GRELLIER.—On Dec. 6, in India, Ernest Franz Waldemar Grellier MB CAMB., [illegible] IC.

KELYNACK.—[illegible] Nicholas Kelynack, MD MANC MRCP, JP, [illegible]

MATHEWSON.—On Dec. 27, at Keswick, John Mathewson, [illegible] MD EDIN.

NEVILLE.—On Dec. 25, Leigh Neville, LRCP.

SIMPSON.—On Dec. 26, in London, George Augustus Garry Simpson MRCS.

WALTERS.—On Dec. 24, Charles Ferrier Walters, FRCS, aged 69.

WILMOT.—On Nov. 24, Reginald Cameron Wilmot, MRCS, colonel late RAMC, aged 67.

AT 5 PM on Monday, Jan. 8, at 11, Chandos Street, W1, there will be a pathological meeting of the Medical Society of London.

[illegible]

PLEURAL AND PULMONARY SUPPURATION TREATED WITH PENICILLIN

J. E. H. ROBERTS
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SURGEON-IN-CHARGE

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SURGICAL REGISTRAR

EMS CHEST UNIT

PENICILLIN was made available to an EMS Chest Unit by the Medical Research Council's Penicillin Clinical Trials Committee, and this paper reports the results obtained. Initially there was only sufficient for local application, and its value in the prevention and treatment of empyema and extrapleural suppuration was studied first. More recently larger supplies were obtained and used systemically in the treatment of pulmonary infections but this latter investigation is far from complete.

The cases treated by local application fall into the following groups—

1. Hæmothorax (prevention of infection)
2. Pyogenic empyema.
3. Tuberculous empyema with secondary pyogenic infection.
4. Extrapleural suppuration (complicating thoracoplasty and extrapleural pneumothorax)

Hæmothorax

Although we were aware that many cases of traumatic hæmothorax had been treated with penicillin in the [illegible] e were anxious to obtain [illegible] ourselves its value in pre- [illegible] ascertain the amount and [illegible] required to achieve this, before casualties arrived from the battle in France. Unfortunately only two such cases were forthcoming.

The first was a patient with carcinoma of the bronchus who was daily expectorating 2–3 oz. of purulent sputum derived from the lung distal to the site of obstruction. The predominant organism in this sputum was *Streptococcus viridans*, which was shown to be penicillin-sensitive. At the operation of pneumonectomy the lung was accidentally torn as a result of dense pleural adhesions, and pus was spilt in the pleural cavity. At the end of the operation the pleural cavity was carefully dried out and 30,000 units of penicillin (as well as some sulphanilamide-sulphathiazole powder) distributed around the space; the chest was then closed without drainage. No pleural infection occurred until 11 weeks after operation when a bronchial fistula developed. Blood-stained fluid aspirated 48 hours after operation did not contain a demonstrable amount of penicillin. (The rate of absorption of penicillin from the pleural cavity is discussed under the treatment of established empyema.)

The second case was an air-raid casualty in which the chest had been penetrated by a bomb fragment. The foreign body was removed at a primary operation and on culture yielded a profuse growth of a coagulase-negative staphylococcus. The pleural cavity was not drained after operation as very little bleeding had taken place into it. Subsequently a blood-stained pleural effusion developed, from which a coagulase-negative staphylococcus was grown. At the time of aspiration 20,000 units of penicillin was injected into the pleural cavity, and on re-aspiration 4 days later sterile fluid containing no demonstrable penicillin was withdrawn; a further 20,000 units was injected and no empyema developed.

It would obviously be wrong to draw conclusions from two cases, but we were impressed by the first case in which almost ideal experimental conditions obtained—i.e., an undrained hæmothorax which was known to have been contaminated by spilt pus.

Since June 6, 1944, we have treated 10 cases of hæmothorax resulting from penetrating wounds by the usual procedure of keeping the pleural space dry by aspiration, but, in addition, penicillin solution has been injected at each aspiration, the dose varying with the likelihood of contamination (15,000–60,000 units). Only one of these cases has become infected and this by coliform bacteria which are, of course, completely penicillin-resistant.

Infection of a hæmothorax results in a great increase of fibrin deposition, which often causes loculation; frequently some of the loculi contain infected fluid, whereas in others the fluid is sterile. Jeffery and Scott Thomson (1944) have drawn attention to the difficulty of getting the drug to the infected loculi, and the patient aspiration required to achieve this. It seems to us that, if this degree of clotting has occurred, rib-resection and evacuation of the clot is indicated, and that penicillin would be used more advantageously as a postoperative measure to prevent the pleural infection progressing to the stage of frank pus.

Pyogenic Empyema

When considering the part penicillin is likely to play in the treatment of acute pyogenic empyema, certain *general principles must be kept in mind.*

First, the period during which a patient's life is likely *to be endangered by an empyema* is the initial phase in its development, the stage in which there is a turbid *unlocalised pleural effusion* giving rise to severe toxæmia and occurring perhaps when the pneumonic infection is still active—e.g., [illegible] complicating an [illegible] cumstances repea [illegible] performed in orde [illegible] which might be [illegible] toxæmia and of h [illegible] process would ob [illegible]

Secondly, the correct treatment of a case in which the pus has become thick (indicating localisation of the empyema) is rib-resection, removal of pus by suction and of fibrinous masses with sponge-holding forceps, and the insertion of a drainage-tube which is not removed until the lung has completely re-expanded, this re-expansion being encouraged by breathing exercises and activity on the part of the patient. Anything which delays rapid re-expansion of the lung, such as *pleural thickening*, is bound to retard recovery and militate against complete restoration of respiratory function.

In addition to these general principles, it is well to remember that various agents sometimes capable of sterilising pleural pus in vivo are already known. For exam [illegible] was [illegible] but, [illegible] use [illegible] due to gross pleural thickening. Again, occasionally the pus in an empyema complicating a pneumonia which has been treated by intensive sulphonamide therapy is found to be sterile, or becomes so with continued chemotherapy, but, with the exception of those cases which never go on to form thick pus, drainage by the usual method is necessary if a contracted and relatively immobile chest is to be avoided.

On theoretical grounds therefore it seemed probable that penicillin would assist localisation of an empyema during the early phases in its development; it might even prevent the formation of frank pus and cause rapid absorption of the existing pleural exudate. Its value in the treatment of a case in which thick pus had already formed was much less predictable.

We have treated 12 cases of acute empyema with penicillin. In 11 of these the pleural exudate was already frank pus when treatment was started, so we have been able to observe the value of penicillin in the early invasive stage in only one patient.

A boy of 16 attended a hospital on Dec. 28, 1943, complaining of cough with foul sputum of recent onset. A radiograph showed an abscess in the right middle lobe but he was sent home. On Jan. 2, 1944, he was admitted to the Chest Unit in a very serious condition, having developed an acute exacerbation of his illness five days previously. He was cyanosed, orthopnœic, and coughing repeatedly with offensive breath and sputum; the pulse-rate was 160 per min. and the temperature 103° F. He had signs of a right pleural effusion which was confirmed by X-ray examination, [illegible]

[illegible] the aspirat [illegible] cat [illegible] aspiration was repeated next day and a furt [illegible] injected. Subsequent to this the pleural fluid became and remained sterile, but the most striking observation was the extremely rapid and great improvement in the patient's general condition, for in 4 days his desperate state on admission was entirely relieved. Aspiration and intrapleural injection of penicillin (total dose 180,000 units) were repeated on two more occasions, and after the first of these a bronchial fistula developed; this did not cause re-infection of the pleural pus but altered the character of the sputum from fœtid pus to penicillin-stained mucus. It is our impression that the bacteriostasis produced by the penicillin resulted in rapid diminution of the intense toxæmia and that this patient's life was thereby saved. The empyema was drained on Jan. 17 (15 days after admission) by rib-resection, since it was thought unwise to continue without drainage in the presence of a bronchial fistula. The patient is now well.

In the remaining 11 cases of acute empyema (those with frank pus at the time of admission) various methods of local application were tried. The infecting bacteria (hæmolytic streptococcus in 4 cases, pneumococcus in 3, staphylococcus in 1, non-hæmolytic streptococcus in 1, non-hæmolytic microaerophilic streptococcus in 1, and a mixed infection with *Staphylococcus aureus*, hæmolytic streptococcus, and non-hæmolytic streptococcus in 1) were shown to be penicillin-sensitive before treatment was started. In 8 out of 10 cases treated by aspiration followed by intrapleural injection of penicillin the pus was sterilised; sterility was achieved after a single injection in 5 cases, after 2 injections in 2, and after 3 injections in the other. The average dosage was 30,000 units initially, followed by 20,000 units at 48–72 hours intervals, a solution containing 1000 units per c.cm. being used. Sterility was not obtained in 2 cases simply because treatment was discontinued prematurely for some clinical reason (one patient received a single dose only, and, in the case with the mixed infection, treatment was stopped after 3 injections totalling 60,000 units which abolished all the bacteria except a few staphylococci).

The significance of a single sterile specimen of pus was not fully appreciated initially. In such a specimen poorly staining bacteria, many of them intracellular, might be seen in a gram film and recrudescence of the infection seemed possible. This in fact occurred in 2 cases, and, judging from this and our experience with other localised collections of pus, it is clear that at least 3 and preferably more injections subsequent to sterilisation should be given if permanent sterility is the aim.

Examination of each sample of pus for its penicillin content showed that the penicillin was only slowly absorbed from the empyema cavity, an appreciable quantity being invariably found 48 hours after the last injection (the average case at this time showed an 8 mm. zone of inhibition round an agar cup filled with the pus in a plate heavily inoculated with the Oxford H staphylococcus). In some cases there was still a detectable quantity after 4 days. This suggests that absorption may be slower through the walls of an established empyema cavity than through the virgin pleura—e.g., that associated with a traumatic hæmothorax.

Simple aspiration and intrapleural injection of penicillin were never continued for more than 24 days, so the final result obtainable by such treatment was never seen. It was not persisted with because the pus usually became thicker rather than thinner, and fibrinous masses often made it difficult or impossible to aspirate completely. Further, serial radiographs showed progressive pleural thickening which made it clear that the final functional result would fall short of that obtainable by ordinary rib-resection drainage. Butler, Perry, and Valentine (1944) have shown how severe this pleural thickening may be in cases treated without operation.

In 7 cases, intrapleural injection of penicillin was followed by rib-resection drainage and no further penicillin was used. In 4 of these cases the pus was sterile at the time of operation but this apparently had no favourable influence on the subsequent progress of the case—i.e., the empyema cavity did not become obliterated more rapidly than in the average case, in fact in patients re-expansion of the lung was retarded because drainage had been postponed beyond the usual time.

In 3 cases intrapleural penicillin injection was used until the pus was sterile in 2 and almost so in one (in the case with mixed infection a few staphylococci persisted), and this was followed by rib-resection and evacuation of all pus and fibrin, the wound then being sutured round a fine-bore tube which was closed externally with a spigot and subsequently used for aspiration of pus and the instillation of penicillin. In the case with persistent staphylococcal infection the bacteria were still present after 4 days (20,000 units of penicillin daily), and since thick pus continued to form the tube track was enlarged and open drainage adopted. In one of the 2 sterilised cases, the tube was removed on the fifth day (the pus being sterile at this time), but the infection was again active 4 days later and open drainage was therefore instituted. (This patient received only one preoperative and one postope[illegible] case (hæmolytic [illegible] twice weekly after operation, and, although the exudate became almost entirely serous. [illegible] staphylococci were cultured from it [illegible]tion; as X-ray examination at this time showed that a large cavity was still present, open drainage was provided.

Finally one patient with a mild staphylococcal infection was treated by rib-resection, evacuation of all pus and fibrin, and suture of the wound round a fine-bore tube, through which he received three instillations of penicillin during the first postoperative week; the tube was then removed because the exudate was sterile. No penicillin was given before operation. He was discharged 15 days after operation and now (5 months later) remains healed and well.

From our experience with these cases, and the valuable ev[illegible] by Butler et al. (1944), we feel that a [illegible] pleural aspiration and injection of penicillin alone as a means of "curing" empyema will result in many patients being left with gross pleural thickening and therefore diminished respiratory reserve. In some a residual, although sterile, cavity will probably remain, and these patients will swell the numbers of "latent" chronic empyemata. In many cases it is doubtful if the time taken to produce such a "cure" is any less than by the standard method of treatment. It seems probable therefore that penicillin has little, if any, part to play in the treatment of an empyema from which thick pus is obtained on aspiration and which is not giving rise to severe toxæmia. (Postpneumonectomy empyema is excepted from this opinion.) On the other hand, penicillin employed at the inception of empyema formation is likely to be a life-saving agent in patients with overwhelming toxæmia or those still suffering from active pneumonia, especially in children or aged people.

Tuberculous Empyema with Pyogenic Infection

Pyogenic secondary infection of a [illegible] or empyema often results in grave t[illegible] necessitates pleural drainage; it also carries a very high mortality. Any drug capable of abolishing the pyogenic bacteria and thereby reducing toxæmia would be of inestimable value, for it might then be possible to persuade the lung to re-expand so as to obliterate the pleural space, or the patient might be rendered fit for thoracoplasty without preliminary pleural drainage.

An important distinction must be drawn between these cases and those of simple pyogenic empyema, for respiratory function can never return to normal in the tuberculous case and pleural thickening is therefore of no significance.

Persistent fever after pleural drainage is common and is generally thought to be due to continued tuberculous activity in the pleural membrane, but it is possible that the secondary infection plays some part in the toxæmia.

We have treated 7 cases of secondarily infected tuberculous empyema (5 undrained and 2 drained) with penicillin, and, although the results may not appear dramatic, we feel that penicillin is likely to play a very important part in the treatment of this type of case. None of our patients had a demonstrable bronchial fistula, which would almost certainly make the case unsuitable for penicillin therapy.

Some idea of the value of penicillin in this condition may be obtained from the following brief record of cases treated.

CASE-RECORDS

CASE 1.—A man of 47, suffering from bilateral pulmonary tuberculosis, developed a spontaneous pneumothorax which had been treated by decompression through a needle connected to a water-seal. The needle track became infected with coagulase-positive staphylococci which subsequently spread to the pleural space. The pleural pus also contained a few tubercle bacilli. The pus was aspirated every 2–4 days and penicillin injected, large doses (50,000 units) being used on the first four occasions. The pus became sterile after the sixth injection (total dose 220,000 units). Unfortunately very large masses of fibrin formed (they could be seen protruding above the fluid level in a radiograph) which made further aspiration impossible although there was gross mediastinal shift due to the bulk of exudate. Rib resection and evacuation of the pleural contents were therefore performed and followed by drainage. The cavity was obliterated and the wound healed in [illegible] months.

CASE 2.—A woman of 32 was admitted with a total left-sided pyopneumothorax, the infection being an immediate sequel to thoracoscopy and division of adhesions; there was also a discharging abscess in the anterior chest wall at the site of previous pleural puncture. A pure growth of hæmolytic streptococci was obtained from the pleural pus but no tubercle bacilli were found in it. A single injection of 30,000 units of penicillin (given on Jan. 18, 1944) resulted in sterilisation of the pus but the subsequent story is instructive. On Jan. 21 and 23 paracentesis was repeated and 15,000 units of penicillin injected on each occasion; examination of the pus on the 23rd showed a very few poorly staining cocci in a gram film but culture was sterile. On the 24th the chest-wall abscess was incised and a pure growth of hæmolytic streptococci obtained from the pus. On the 28th pleural aspiration was repeated and poorly staining gram-positive cocci in chains were again seen in the film although the culture was sterile; no penicillin was injected at this time. On Feb. 1 pus withdrawn grew hæmolytic streptococci, and, in addition, coliform bacilli in large numbers; the latter were, of course, completely penicillin-resistant but did not produce a penicillinase. More intrapleural penicillin again resulted in inability to culture the streptococci, but, since the coliform organisms continued in large numbers and a gross communication between the chest wall abscess and the empyema developed, the empyema was drained.

It is our belief that the coliform bacteria probably gained entrance to the empyema as a result of secondary infection of the [illegible] This abscess may also have been [illegible] with hæmo- [illegible] that the cocci [illegible] it is certain [illegible] should not have been relied [illegible] in view of the demonstra[illegible] this course of treatment.

This case illustrates well how penicillin treatment may be frustrated as a result of secondary infection by penicillin-resistant organisms.

CASE 3.—A woman of 32 had had a three-stage thoracoplasty for pulmonary tuberculosis, a previous pneumothorax having failed because of adhesions and being complicated by an effusion. Two weeks after the last operative stage the pleural effusion apparently became secondarily infected, and [illegible] month later through the thora- [illegible] was admitted for [illegible] ing a high fever; [illegible] streptococci was oozing from a sinus at the lower end of the thoracoplasty wound. On March 8 similar pus was aspirated from the pleural space and 38,000 units of penicillin was injected. Aspiration was repeated on March 14 and 17, 20,000 units of penicillin being injected on the 14th; no organisms were seen in a film of the pus obtained on the 17th and culture was sterile. On the 24th a further 20,000 units of penicillin (final dose) was administered, the pus withdrawn at this time showing no organisms in film or culture. The thoracoplasty wound had completely healed on April 16, and thick pus aspirated on April 18 was still free of organisms. The patient returned to the sanatorium on April 29, greatly improved in general condition and without fever.

In this case an empyema was sterilised—apparently permanently—by three penicillin instillations totalling 78,000 units. With regard to the likelihood of recurrence of infection, it is noteworthy that no organisms were seen in a gram film after the second dose; the complete absence of bacteria in a film in addition to a sterile culture is almost certainly much better evidence of final destruction of the bacteria than a sterile culture alone.

CASE 4.—A man of 27 had left-sided pulmonary tuberculosis which had been treated by an artificial pneumothorax; this was complicated by a tuberculous effusion following section of adhesions. Two weeks before admission for penicillin treatment the effusion became secondarily infected with staphylococci which caused persistent pyrexia and failed to respond to repeated aspiration. On March 13, 1944, thick pus was withdrawn and found to contain staphylococci and two types of gram-negative bacilli, one being *Ps. pyocyanea*. Aspiration was repeated on the 14th and 17th and 20,000 units of penicillin injected on each occasion; pus removed [illegible] cocci (mostly intra- [illegible] on culture the same [illegible] March 21, paracentesis and injection of 20,000 units of penicillin were again performed; the pus showed no cocc[illegible] seen and cultured. In view of th[illegible] completely penicillin-resistant no [illegible] but aspiration alone was contin[illegible] showed no organisms and was sterile. The patient, afebrile and improved in general condition, returned to the sanatorium on April 7.

TABLE I—CASE 5 (see text).

Day	Amount aspirated (oz.)	Character of pus	Gram film	Culture	Penicillin content (min. inhibition of standard strain)	Penicillin injected (units)
1	4	Thin	Many cocci	Staphs, profuse growth	NE	60,000
6	4	Thick	Fewer cocci	Staphs, mod. growth	,,	70,000
8	30	,,	Few cocci (mostly intracellular)	Staphs, scanty growth	3	60 000
10	10	,,	Very occasional coccus	Sterile	5	45,000
12	16	,,	,,	,,	13	70,000
15	7	,,	No bacteria	,,	NE	20,000
19	6	,,	,,	,,	2	20,000
21	8	Thin	,,	,,	2	20,000
29	10	,,	Occasional *coccus*	Gram-neg. *bacilli*, scanty growth	NE	20,000
42	14	,,	No bacteria	Sterile	,,	20,000
					Total	405,000

NE = not examined.

This case is of interest in that elimination of the initial secondarily infecting organism (the staphylococci) by penicillin was followed by the disappearance of the other organisms (which were penicillin-resistant) as a result of repeated paracentesis.

It is worth pointing out here that penicillin will almost certainly prove useless in cases of mixed secondary infection if this includes penicillin-resistant bacteria which produce a penicillinase and thus destroy the drug.

CASE 5.—A man of 24 had a tuberculous effusion secondarily infected with a coagulase-positive staphylococcus. When admitted for penicillin treatment he looked extremely ill and was running a high fever. He was treated by aspiration and intrapleural penicillin injection, the dosage and changes in the characters of the pus being shown in table I. Large doses were used because the empyema was total and a large space had to be sterilised; the doses used were probably not in excess of those required, for no sample of pus examined for its penicillin content contained a very high titre of penicillin (with the exception of that withdrawn on day 12). The findings on day 29 were probably due to contamination. Penicillin may have been continued longer than necessary but recurrence of infection was feared as a result of our experience up to this time.

CASE 6.—A man of 37 was admitted in extremely poor condition with a tuberculous effusion secondarily infected with coagulase-negative staphylococci. Penicillin was not available at this time and the empyema was therefore drained. Three weeks later his condition was still deteriorating; penicillin was instilled through the drainage-tube which was then occluded for 3 days and the process repeated. No improvement resulted and the patient died 6 weeks after admission.

CASE 7.—A man of 24 had a drained secondarily infected tuberculous empyema. For 2 months he had been afebrile when his temperature rose suddenly to 104° F and examination of the pus from the drainage-tube revealed hæmolytic streptococci, pneumococci, staphylococci, and *Ps. pyocyanea* (the original secondary infection was an unidentified gram-negative bacillus); 20,000 units of penicillin in 150 c.cm. of saline was run into the cavity through the drainage-tube which was then spigoted; the field was released after 72 hours. After a day's interval the process was repeated for 24 hours and the pus subsequently released grew *Ps. pyocyanea* only. The fever settled during this period of penicillin treatment and the drug may well have played a part in its rapid subsidence.

Extrapleural Suppuration

Three cases of coagulase-positive staphylococcal suppuration occurring in the deep part of a thoracoplasty wound (the "apicolysis" or "Semb" space) have been treated by aspiration and injection of penicillin. In two of these the sutured part of the wound was not infected. but in the other the infection spread from the superficial part of the wound to the underlying space. In this third patient a fine tube was passed through a small deficiency in the wound and penicillin instilled through this each day; the staphylococci disappeared after 9 instillations but the space the[illegible] infected with *Ps. pyocyanea*, which [illegible] of the space as the patient continued febrile.

In the two cases with the superficial part of the wound uncontaminated, the space was aspirated from in front and penicillin injected every 3–4 days, the usual dose being 20,000 units; the interval between injections was increased towards the end of treatment. In one case sterility was obtained after 4 injections totalling 80,000 units and recrudescence of infection was prevented by 3 subsequent injections of 20,000 units each. The other case illustrates once again the danger of recurrence of infection when penicillin therapy is stopped prematurely (see table II). However, the space was ultimately permanently sterilised. Both of these patients returned to their sanatoria afebrile and with soundly healed wounds.

TABLE II—CASE OF SUPPURATION IN APICOLYSIS SPACE FOLLOWING THORACOPLASTY (see text).

Day	Amount aspirated (oz.)	Character of fluid	Gram film	Culture	Penicillin injected (units)
1	¼	Thick, blood-stained	Staphs ++	Staphs, profuse growth	50,000
5	2	,,	,, ,,	Staphs, fairly profuse growth	40,000
8	2	,,	,, ,,	Staphs, scanty growth	20,000
12	11	,,	Occasional staphs	7 colonies of staphs	20,000
15	1	V. blood-stained	Some degenerate-looking cocci	1 colony of staphs	20,000
19	15	Thick, blood-stained	"Quite a lot of poorly-staining cocci"	Sterile	20,000
22	9	,,	"Few cocci"	,,	20,000
26	5	,,	No bacteria seen	,,	20,000
27	11	Blood *	,, ,,	,,	..
29	8	Blood-stained	"Few cocci"	,,	..
43	9	,,	Large numbers of cocci	Staphs, profuse growth	20,000
47	9	Thin brown	Cocci present	Staphs, less profuse growth	20,000
50	9	,,	Some present	Staphs, scanty growth	20,000
54	3	Yellow, turbid	No organisms	Sterile	20,000
57	3	,,	,,	,,	20,000
64	6	,,	Occasional coccus	,,	20,000
71	4	,,	No organisms	,,	20,000
78	2	Clear yellow	,,	,,	20,000

* Post hæmorrhage into space.

One case of extrapleural pneumothorax which had become infected with anaerobic staphylococci and anaerobic gram-negative diplococci was received for penicillin treatment. These unusual bacteria were both shown to be fully penicillin-sensitive. The space was aspirated and 20,000 units of penicillin injected every 3–4 days on 26 occasions. The pus became sterile for 4 separate periods, but, in spite of no relaxation in the dosage (total dose 590,000 units) or in frequency of treatment, infection by the anaerobic staphylococcus recurred each time. Complete evacuation of the contents of the cavity was obtained by suction through a thoracoscopy cannula on one occasion and by extrapleural irrigations performed before the penicillin instillation on two other occasions, but this made no difference and ultimately external drainage had to be provided.

It is hard to understand why the treatment failed, since there was never any evidence of a bronchial fistula which might have provided constant reinfection from the bronchial tree.

One interesting point is the report received after 240,000 units of penicillin had been used in treatment stating that the bacteria appeared to have acquired considerable resistance to the drug; this is the only time in our experience in which such resistance developed during treatment.

Pulmonary Suppuration

Sixteen cases of pulmonary suppuration have been treated by the systemic administration of penicillin. With one exception (case 7) all had been treated previously with sulphonamides without improvement.

Since the response to treatment has apparently depended more on the invading organisms than on any other factor (although the bacteria have been shown to be penicillin-sensitive in vitro in *all* the cases treated), classification according to the bacteriology is clearly the most satisfactory. On this basis we find that 7 were due to a non-hæmolytic, micro-aerophilic streptococcus, 6 to a mixed anaerobic infection, 1 to a combination of *Strep. hæmolyticus* and *Staph. aureus*, and 2 to actinomyces.

In addition, one case of acute tuberculosis was treated in error, the error arising from the finding of *Staph. aureus* in the sputum which was repeatedly negative for tubercle bacilli. Needless to say, therapy made no change in the patient's condition (although the staphylococci disappeared from the sputum) and death quickly followed.

METHOD OF ADMINISTRATION AND DOSAGE

In most cases the penicillin has been given by intramuscular infusion, using the continuous drip method; the site for such administration has always been the lateral side of the thigh. This has proved relatively satisfactory but our experience demonstrates the importance of strict asepsis, for 3 patients have developed an intramuscular abscess due to coliform organisms; these abscesses cleared up quickly on ceasing the infusion or transferring it to another site.

In a few instances 3-hourly intramuscular injections have been employed, especially for short periods (12–48 hours) as they make a change to the monotony of protracted drip infusions; if used for longer periods the repeated pricks become a source of anxiety to the patient.

Intravenous administration has been used occasionally, particularly early in the series, but phlebitis with consequent thrombosis was a constant and early feature. In one case (suffering from actinomycosis secondarily infected with *Ps. pyocyanea*) suppuration due to *Ps. pyocyanea* developed in the thrombus and gave rise to a fatal pyæmia. In another, the infusion was continued for 24 hours after the first sign of phlebitis, and this resulted in fever to 106° F. with extreme redness and tenderness over the vein. Latterly therefore, we have rarely employed this method, although Martin's (1944) suggestion of using heparin to prevent the thrombophlebitis may alter this practice.

The daily dose of penicillin for an adult has usually been 120,000 units, but in some cases this has been decreased to 90,000 or even 60,000 units when the larger quantity has yielded a high penicillin titre in the blood [illegible] in 1:4 dilution and partial [illegible] A daily dosage of 120,000 [illegible] a blood titre such that bacteriostasis is complete in pure serum, and very often *this quantity has resulted in complete bacteriostasis* in 1:4 dilution.

The duration of therapy has depended largely on the response to treatment but has averaged 2 weeks. Complete absence of response at the end of 1 week has been deemed an indication for discontinuing therapy. Relatively *long-standing infections, such as actinomycosis,* have been given a longer course (3-4 weeks) than those with a short history.

GROUP 1: NON-HÆMOLYTIC MICRO-AEROPHILIC STREPTOCOCCI *

This group has not received general recognition, so it is necessary to outline the clinical picture of infection of the lung by this organism. Usually of sudden onset and often as a rather late sequel to a surgical operation, the subsequent story is that of a suppurative bronchopneumonia with a varying degree of abscess formation. The lesion is not localised to a single bronchopulmonary segment even *at the start* but is more widespread; the originally infected areas show a tendency to heal but recurrent exacerbations, often with extension to a previously uninfected part of the lung, are usual and death from gradual progression of the suppuration is common. Localised, sometimes *multiple,* empyemata often complicate the picture, and the frequency with which a brain abscess terminates the disease is particularly striking.

Seven of the cases treated with penicillin belong to this group and 5 of them improved greatly during treatment, the improvement being spectacular on one occasion (case 2). In the other 2 there was improvement in the pulmonary condition but both developed a cerebral abscess due to the [illegible] this proved rapidly fatal in spite of [illegible] illin and, in one case, intrath[illegible] injection of the drug.† Two of the 5 cases which improved greatly during penicillin administratic [illegible] in the course of treatment. [illegible] comparable to the cases [illegible] pneum[illegible]

Reports on 3 treated cases follow and these will give the best conception of the results. Case 8 demonstrates improvement followed by uncomplicated recovery. Case 9 is an example of recovery from the pulmonary infection but the picture became complicated by an empyema arising during treatment. This case was probably one of "pulmonary blast" with secondary infection by non-hæmolytic micro-aerophilic streptococci. *Case 10 illustrates the clinical course of the disease* before treatment was started and is also one of the 2 cases in which a cerebral abscess developed.

CASE 8.—A man, aged 37, had appendicectomy for gangrenous appendicitis 4 months before admission and this was followed by a subphrenic abscess which was drained. Subsequently a right-sided empyema consisting of two separate collections of pus—one at the base and one in the interlobar fissure posteriorly—was discovered and each loculus was drained; the causative bacteria were non-hæmolytic streptococci. The tube slipped out of the interlobar empyema before the cavity had healed and could not be reinserted. Two weeks before transfer *left*-sided pleuritic pain with cough and expectoration developed.

On admission, the patient looked exceedingly ill and emaciated; the fingers were clubbed and the temperature reached 101° F each night. A chest radiograph showed a small interlobar empyema on the right and a diffuse irregular opacity with cavitation in the upper part of the left lower lobe. *The predominant organism in the sputum was a non-hæmolytic micro-aerophilic streptococcus.*

Intramuscular penicillin was given by the drip method from April 14 to 21, 1944, inclusive (total dose 1,020,000 [illegible] a pure growth of the same streptococcus), allowing the introduction of a rubber drain, and the patient has since made a complete recovery although there was a transient recurrence of sputum containing the same organism later (May 15).

CASE 9.—A woman, aged 20, received multiple injuries, including a penetrating head wound, from a flying-bomb on July 1, 1944. Operation was performed the same evening and much difficulty was experienced by the anæsthetist in overcoming cyanosis which had been noted before operation. The cyanosis persisted after operation and râles were heard at both bases, especially the left. A radiograph of the chest on July 4 showed a diffuse opacity of the left lower lobe and a smaller irregular shadow extending down from the hilum in the right lower lobe. She was given 66 g. of sulphamezathine as prophylaxis against infection. On July 16 her general condition was good, the temperature reached a maximum of 99° F, and the signs in the chest had decreased slightly. However, bilateral pleuritic pain, cough, dyspnœa, and fever developed next day, and the patient went progressively downhill until July 24, when she appeared moribund (T 101–103° F, P 160–180, R 40–70 per min.).

The sputum at this time showed the predominant infection [illegible] micro-aerophilic streptococcus. Intra[illegible] forthwith [illegible] spectacular [illegible] nt was maintained, but signs of pleural fluid were present on the left and 3 oz. of turbid fluid containing a streptococcus exactly similar to that in the sputum was aspirated. The intramuscular penicillin drip (100,000 units per day) was maintained for 20 days; the temperature reached a maximum of 99° F during the last 11 days of this treatment. The pleural fluid nevertheless developed into thick pus and was not sterilised in spite of additional penicillin (60,000 units on July 31 and 40,000 units on Aug. 3) injected intrapleurally; drainage was therefore provided.

On Dec. 28 the patient was well, with the empyema healed.

CASE 10.—A man, aged 58, developed a low-grade suppurative process in both lower lobes after an abdominal operation (division of adhesions causing subacute obstruction) performed 12 weeks before admission. On admission he looked thin *but not acutely ill. The temperature rose to* 100–101° F each evening. A chest radiograph showed that the lesion in the right lower lobe had almost cleared up, but there were areas of consolidation with some small cavities in the right upper lobe; on the left there was still patchy consolidation in the lower lobe, one area showing a small central cavity, and two small collections of pleural fluid, one in the axilla and the other against the mediastinum.

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* [illegible] has *furnished* us with a note on this organism—"[illegible] which is very commonly found in [illegible] cerebral abscess consequent [illegible] [illegible] oval *coccus occurring in* [illegible] considerable length, sometimes [illegible] on plain agar: grows on [illegible] serum agar; *growth much* [illegible] blood agar aerobically are so [illegible] only with a lens. Anaerobically [illegible] size during several days' [illegible] mm.; they are convex, [illegible] margin, smooth surface, [illegible] ent margin. There is no [illegible] in fluid media gives a [illegible] glucose, galactose, maltose, [illegible] ent raffinose, mannite or, [illegible] ble. Acid and clot pro[illegible] form indol. Not soluble in bile. Test for soluble hæmolysin production in fluid media is negative. Extracts give no reaction with sera of Lancefield's groups A, B, C, and G. Non-pathogenic to mice (intraperitoneal inoculation)."

† Since this report was made, one of the apparent "cures" returned after a month with recurrence of the suppurative process (in a different part of the lung). This was treated with further intramuscular penicillin and he was again discharged apparently cured. He remained well for another month after which he was readmitted with a cerebral abscess from which he died.

The predominant organism in the sputum, which averaged 6 oz. a day, was a non-hæmolytic microaerophilic streptococcus. The axillary empyema was drained on July 13, and the mediastinal collection was similarly treated on July 25, the pus in both instances gave a pure growth of the same streptococcus. There was very little improvement by Aug. 1, expectoration continuing unabated, and an X-ray film showed extension of the suppuration which now involved the whole of the right upper lobe and part of the left upper lobe. A course of systemic penicillin lasting 14 days was therefore started (total 1,680,000 units). This was accompanied by well-marked clinical improvement and abolition of the low-grade fever. The sputum, which was reduced to 3 oz. daily, was less purulent and now contained very few of the previously [illegible]. Radiography showed less consolidat[illegible]

The improvement was short-lived, for the sputum increased after a few days and again showed vast numbers of the same streptococcus. On Aug. 23, 8 days after completing the penicillin, the temperature rose suddenly to 102° F and the patient rapidly became comatose. In spite of a further million units of intramuscular penicillin, he died on Sept. 5 from a left frontal lobe abscess caused by the same organism which had ruptured into the lateral ventricle.

At autopsy, widespread pulmonary suppuration, with many abscess cavities (most marked in the right upper lobe), was found; the oldest lesions had almost healed, with much scarring and secondary bronchiectasis.

GROUP 2: MIXED ANAEROBIC BACTERIA

Of this group of 6 cases only one showed real improvement during treatment. This failure to respond was particularly disappointing in view of the remarkably rapid destruction of bacteria of this type when treated locally in an empyema (see case of fœtid empyema discussed under local treatment and case (12). In 3 of the cases the infection had been present for 4, 8, and 9 months respectively, so there was considerable structural change in the lung and failure in these cases might have been attributed to the chronicity of the infection, but lack of response was equally well marked in one of only 5 weeks' duration (case 13). In the ordinary putrid lung abscess which starts as a localised infection there is sometimes a slough in the cavity and this would be likely to maintain infection, but only one of the treated cases (case 12) was of this localised type and no slough was present in the cavity at the time of drainage. At present therefore we are at a loss to explain the poor results.

The cases chosen for treatment have, with the exception of case 12, been extensive or diffuse infections, for we believe that external drainage will probably continue to give the best results with the localised putrid abscess.

The 3 cases reported below are chosen because case 11 demonstrates the only good result, case 12 illustrates the sensitivity of the bacteria to penicillin when attacked by local treatment, and case 13 is typical of the failures.

CASE 11.—A woman, aged 37, an epileptic, developed a cough with foul sputum and right-sided pleuritic pain about March 15, 1944. A fortnight later she was admitted to hospital where serial radiographs showed consolidation with cavitation starting in the right middle lobe and extending later into the pectoral segment of the upper lobe. Several severe hæmoptyses occurred while in hospital and 26 g. of sulphadiazine caused no improvement.

On admission for penicillin therapy (May 17) she looked ill and ran a low-grade fever. X-ray films showed consolidation with cavitation in the areas mentioned above. The sputum, which was blood-stained and extremely offensive, showed vast numbers of bacteria, mainly gram-positive cocci, gram-positive bacilli, gram-negative cocci and fusiform bacilli; anaerobic culture yielded a mixed growth but the organisms were moderately penicillin-sensitive with the exception of the gram-negative cocci which were fairly resistant. A course of penicillin was given by the intramuscular drip method from May 20 to June 8 (total 1,470,000 units). During this period the cough and sputum diminished, the sputum completely lost its offensive character, and the X-ray appearances greatly improved, for the opacity in the upper lobe decreased and the middle lobe lesion cleared up altogether. The bacteriology of the sputum remained qualitatively the same but there were far fewer bacteria. Subsequently the patient made an almost complete recovery.‡

CASE 12.—A woman, aged 37, was admitted on July 6, 1944, with a putrid abscess of the pectoral segment of the right upper lobe and an expectorated empyema at the base on the same side. Although she had been in and out of hospital for 6 months owing to cough and expectoration, a radiograph taken on June 17 showed only a faint "fluffy" opacity in the right upper lobe, and it was therefore thought that the abscess and empyema were of recent origin.

On admission, she looked extremely ill and had fever rising to 102° F. The stinking brown pus aspirated from the empyema yielded a pure growth of *Staph. aureus* under aerobic conditions and a profuse growth of streptococci, *various gram-negative bacilli*, and some gram-positive bacilli under anaerobic conditions. All these organisms were penicillin-sensitive. The bacteriology of the offensive purulent sputum was similar. Penicillin solution was [illegible] empyema on July 7 (60,000 units) and July [illegible] as a result of which all the anaerobes were destroyed, but staphylococci were still present in profusion. Expectoration was so profuse (up to 15 oz. daily), much of it being derived from the empyema viâ the bronchial fistula, that drainage of the empyema was performed on July 11. Systemic penicillin (intramuscular drip) had been started on July 8 and was *continued until July 22 (total 1,470,000 units) but this did* not diminish the fever or expectoration, although the character of the sputum changed to inoffensive muco-pus. There was considerable improvement in the general condition. The lung abscess was subsequently drained externally because it increased in size.

CASE 13.—A man, aged 31, developed right-sided pleuritic pain, cough, and fever 5 weeks before admission; the sputum, initially small in quantity, soon increased and became foul.

After admission on May 10, 1944, he looked pale and ill, [illegible] [r]ose to 101–102° F each evening. A [illegible] consolidation of the right upper lobe and a tomogram revealed small cavities in this lobe and showed that the lobar bronchus was free from obstruction. The sputum, which was slightly offensive and averaged 6 oz. daily, contained large numbers of organisms, especially gram-positive and gram-negative cocci and some fusiform bacilli; aerobic culture yielded a predominant growth of non-hæmolytic streptococci; anaerobic culture produced a profuse growth of hæmolytic streptococci, an unidentified gram-negative coccus, and non-hæmolytic streptococci. The hæmolytic streptococcus was reported as fully penicillin-sensitive *and the gram-negative coccus and non-hæmolytic* streptococcus as moderately so. Commencing on May 12 he was given 12 days' treatment with penicillin by the intramuscular route (total 960,000 units), but this caused no improvement in the volume of his sputum and little change in its bacteriology.

After the penicillin had been stopped, high fever persisted for 2 weeks; the pyrexia then ceased suddenly after a transient increase in the amount of sputum and the patient made uninterrupted progress to almost complete recovery.

GROUP 3: *Staph. aureus* AND *Strep. hæmolyticus*

Only one case of suppuration due to these organisms has been treated and this improved during therapy. Increased expectoration, indicating better bronchial drainage, followed initiation of penicillin therapy and the general improvement might possibly be explained by this alone, but it seemed to us that penicillin almost certainly played a considerable part in the excellent result. It will be noticed that the cavity in the lung persisted for a long time after all symptoms and signs had disappeared.

CASE 14.—A man, aged 51, developed an abscess in the right lower lobe after a 2-stage mastoid operation. He was admitted to the Chest Unit 2 weeks after the first chest symptom. At this time he did not look ill and was almost afebrile. A chest radiograph showed a circumscribed abscess cavity 2½ inches in diameter with a fluid level in the right lower lobe. The inoffensive purulent sputum, which averaged 1–2 oz. daily, contained hæmolytic streptococci and coagulase-positive staphylococci. Penicillin was given by intramuscular drip from April 26, 1944, to May 11 inclusive

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‡ Subsequent to making this report and to the patient's discharge from hospital he developed a recurrence of the pulmonary suppuration and has been admitted to another hospital

(total 1,380,000 units). The sputum increased during the early stages of this treatment, reaching a maximum of 7 oz. daily, then rapidly decreased and finally ceased. Culture of the sputum after 7 days' treatment failed to grow any hæmolytic streptococci and only a few staphylococci.

X-ray examination showed a smaller cavity and no fluid level at the time of discontinuing penicillin; the patient was subsequently free of symptoms but complete disappearance of the cavity was not demonstrated radiographically until July 6.

GROUP 4: ACTINOMYCOSIS

Two cases of thoracic actinomycosis—both with pulmonary infection and extensive chest-wall involvement—have been treated with penicillin.

The first patient died from *P. pyocyanea* pyæmia arising from suppurative thrombophlebitis of the infused vein, but the effect of the drug in vitro on the actinomyces obtained from this case was instructive for growth in glucose-broth was inhibited by 0·2 unit per c.cm. but not by 0·1 unit. (In a control test with the standard staphylococcus, the corresponding concentrations were 0·05 and 0·025 unit per c.cm.)

The other case reported below was indeed dramatic for the patient was transformed from a dying man to one who on Dec. 28 was apparently in good health. Nevertheless anxiety persists with regard to the permanency of the result. It will be noted that the second course of treatment was continued for a very long time (28 days) and that the daily dose was also unusually high (200,000 units); this was intended to reduce the risk of recurrence.

It is clear that penicillin therapy should receive a lengthy trial in actinomycosis of the chest, for the mortality has been terribly high in the past.

CASE 15.—A man, aged 22, had his left arm blown off and the left lower chest wall "peppered" when a hand-grenade he was carrying was detonated by a bullet on Nov. 2, 1943. He made good progress and all wounds healed, but while on disembarkation leave in January, 1944, he developed pain over the left 11th rib and was admitted to hospital. High fever followed and a swelling appeared over the left lower chest wall. On Jan. 25, 1944, the 11th rib was resected and [illegible] sive pus was found [illegible] -sided basal pleural [illegible] ng the subsequent 4 months there was almost continuous pyrexia with occasional short remissions and the man went steadily down-hill in spite of blood transfusion and intensive therapy with sulphadiazine, sulphapyridine, sulphamezathine and sulphathiazole. In addition, swelling occurred below the left costal margin and in the left loin and three further drainage [illegible] ere performed. Finally a cough with about [illegible] um daily developed. [illegible] itted to the Chest Unit on May 23 he looked ill, pale, and thin. The temperature rose to [illegible] ach night. There was much induration over [illegible] chest wall and loin extending down to the iliac [illegible] st radiograph showed a left basal pleurisy and [illegible]" opacity in the adjacent lung. Both the sputum and the pus from the unhealed drainage wounds contained numerous "sulphur granules" which microscopically consisted of the gram-positive branching mycelium typical of actinomyces. The actinomyces was cultivated and found to be an atypical strain requiring CO_2 as well as anaerobiosis for growth; the colonies were viscous and weblike instead of the usual compact mass. Its penicillin-sensitivity equalled that of the standard Oxford staphylococcus, and a course of penicillin was given by intramuscular drip method from June 26 to July 10 (total 1,800,000 units). The response was striking—the temperature, which had continued to rise to 100–101° F for 5 weeks after his transfer to the Chest Unit, became normal in 24 hours, the inflammatory changes around the sinuses disappeared, and the cough and expectoration ceased. Further, the discharge from the sinuses no longer contained sulphur granules and a chest radiograph showed complete absence of any pulmonary shadowing and much less pleural opacity.

For 3 weeks after this he remained afebrile and free of cough, and his general condition was greatly improved. Fever then returned, the chest wall again became red and indurated, and a few sulphur granules were found in the discharge. On Aug. 9 another course of penicillin lasting 28 days was started, 200,000 units being given daily. Response to this therapy was as rapid as before and all the sinuses had healed by the time treatment ceased.

It remains to be seen whether penicillin can be made to cure the disease finally rather than produce a remission.

Summary and Conclusions

Penicillin appears to lower the incidence of infection in cases of traumatic hæmothorax, which is in accordance with the findings of other investigators.

Twelve cases of acute pyogenic empyema have been treated locally with penicillin [illegible] obtained re[illegible] of penicillin [illegible] that operat[illegible] required as soon as thick pus forms. Evacuation of all fibrin and subsequent closure of the wound may prove satisfactory in some cases but the most uniformly good [illegible] be obtained by drainage. Intr[illegible] clearly play its most important r[illegible] an early stage when the fluid is s[illegible] has not occurred. This applies [illegible] streptococcal origin with the pneumonic process remaining active, especially in children or the aged.

Intrapleural penicillin is a valuable agent in eradicating secondary infection from tuberculous pleural effusions. [illegible] the chest—e.g., those [illegible] be permanently steri-[illegible]

The syst[illegible] in cases of pulmonary [illegible] tion. The [illegible] investiga- [illegible] hæmolytic [illegible] ue to non- [illegible] ears to be good. The lesion in the lung improved in all 7 cases treated but extension to the pleural cavity was not prevented in 2, nor was metastatic spread to the brain in 3 others. Of 6 cases of suppuration due to a mixed anaerobic flora improvement was obtained in only one. This was surprising in view of the rapid disappearance of such bacteria from 2 empyemata treated locally.

A single case of localised pulmonary abscess due to *Staph. aureus* and *Strep. hæmolyticus* apparently responded well.

Two cases of the [illegible] treated. One of these showed [illegible] nd is now well; this case will [illegible] result is permanent. The other died of *Ps. pyocyanea* pyæmia originating from the infused vein.

We wish to thank all those who have helped and made possible this investigation.

We are indebted to the Penicillin Clinical Trials Committee of the Medical Research Council who provided the penicillin. The immense amount of bacteriological work entailed in this investigation was carried out by Prof. L. P. Garrod and Miss P. M. Waterworth; in addition, Professor Garrod has given us much other help and advice. We are also grateful to Dr. T. A. Grimson, who [illegible] the systemic administratio[illegible] who made suitable clinical [illegible] available, in particular to Prof. R. V. Christie from whom we received much valuable counsel.

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EVACUATION OF WOUNDED.—Better evacuation of wounded from the firing line has been made possible, the *Times* (Jan. 1) announces, by the use of a new small aircraft which pilots claim can "land in a cow pasture." These planes, called Norsemen, are Canadian-built. They can carry 3 stretcher-cases or 5 walking wounded, and their use was suggested by Brigadier-General M. C. Grew, chief surgeon of the United States Air Force in Europe. The big Dakota transports cannot land on the damaged airfields left by the retreating Germans, but the little Norsemen can slip in, take up casualties and carry them to the Dakota waiting on the nearest big airstrip, to take them to hospital in France or England. The Norsemen are unarmed and not marked with the Red Cross. On their outward journeys they carry blood, penicillin, oxygen, and spare stretchers to surgeons working in the front line.

CLINICAL EVALUATION OF DIPHTHERIA PROPHYLAXIS

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THE efficiency of prophylactic inoculation against diphtheria has been judged mainly on statistics of resulting Schick-conversion rates and of lessened incidence of the disease in communities so protected. As examples of the former, Fulton and his [illegible] have shown that with modern dosage [illegible] sion rate of 97% can be obtained with APT, while Freeman (1942) quotes a conversion-rate of 99% with TAF. On the other hand, the greatly lessened prevalence of diphtheria and of mortality therefrom in some North American cities are attributed to the policy of systematic active immunisation of children. Thus Fitzgerald (1938) found that in 1927–32 inoculation reduced the incidence by 90% in the inoculated as compared with the uninoculated, while the mortality has shown a large decline in the cities of the United States during 1928–40, which is held to be the outcome of prophylaxis (see *J. Amer. med. Ass.* 1942, **118**, 714). In Germany, however, the experiences of some physicians were not so happy, according to Forbes (1931). In England and Wales, the official view stated by Brincker (1943) was that for every immunised child who contracted diphtheria in 1942, 5·6 non-immunised children became victims; this relation was 1 : 11 for mortality from the disease. The parallel Scottish figures given by Russell (1943) were 1 : 8 for comparative incidence in school-children, 1 : 20 in preschool children; for mortality, the ratio was less than 1 : 100.

The following observations on the behaviour of diphtheria in Gateshead are based on clinical findings in subjects who were exposed to the same risk at the same time.

Since the autumn of 1936, Gateshead has had a high incidence of unusually virulent diphtheria, following on a period of low prevalence. The average annual notified case-rate was 0·76 per 1000 of population during 1901–35. From 1936 to 1943 there have been 2278 clinical cases. Deaths among these numbered 123, giving a case-mortality of 5·4%. The corrected annual case-rate during the last seven years averaged 2·7 per 1000, the highest being 4·4 in 1937, in which year the national uncorrected case-rate was 1·49 (1943).

In November, 1937, serial typing of the causal bacilli from cases admitted to hospital showed the prevalence of gravis strains in 35 and mitis strains in 39 of 78 cases, but in the years 1941–43 the predominant strain of infecting organism was *C. diphtheriæ gravis*, which was found in 128 of 158 cases (80%) from whom the causal organisms were typed. (The other strains isolated were intermedius 13, mitis 10, atypical 7.)

Systematic prophylaxis began in Gateshead in 1941 and was concentrated, at first, on all children under 12 years, the usual procedure being the injection of 0·1 c.cm. of APT followed by a dose of 0·5 c.cm. In May, 1942, the first dose was increased to 0·2 c.cm. of APT and the work directed mainly to the children under 5 years and entrant school-children. Children over 9 years of age were treated by three injections, each of 1 c.cm. TAF. Post-Schick testing was not done, so the term "inoculated" is used in referring to these children. Records were kept so that the dates, brand, and dosage of prophylaxis could be traced. Burroughs Wellcome products were used throughout in the children fully inoculated, except in 587 children, in whom one or both injections of APT were of an antigen later suspected to have been of low potency.

Out of a population under 15 years of age, which was fairly constant, and actually 26,825 at mid-year 1943, the numbers of fully inoculated children under 15 years, including about 300 inoculated by private practitioners or when evacuated, were 10,622 at the end of 1942 and 13,957 at the end of 1943.

INCIDENCE AND MORTALITY IN CHILDREN IN 1943

The number of inoculated children under 15 years at risk during 1943 is arrived at by taking the mid-year figures, and correcting for the ageing of children inoculated in previous years. The results of the comparison are given in table I, the children under 15 years, who had not had a full course of prophylactic, being subdivided into those who had had a single dose or two of TAF, those who had survived an attack of diphtheria in 1936–42, and those devoid of known immunising influences.

TABLE I—COMPARISON OF INCIDENCE AND MORTALITY OF DIPHTHERIA IN CHILDREN IN 1943

	Category	No.	Case	Case-		Case-
	[illegible]	[illegible]	[illegible]	[illegible]	0	0
Children under 5 yr.	1. Previous diphtheria	52	0	0	0	0
	2. Partly inoculated	385	4	10·4	0	0
	3. Unprotected	5615	53	9·4	6	11·3
	Total other children	6052	57	9·4	6	10·5
	(*a*) Fully inoculated	9886	84	8 5	0	0
Children 5–14 yr. *inclusive*	(*b*) Other children—					
	1. Previous diphtheria	1130	2	1·8	0	0
	2. Partly inoculated	2873	26	*9 0*	3	*11·5*
	3. Unprotected	4481	69	15 4	8	11·6
	Total other children	8484	97	11·4	11	11 3
	(*a*) Fully inoculated	12,289	92	7·5	0	0
All children under 15 yr.	(*b*) Other children—					
	1. Previous diphtheria	1182	2	1·7	0	0
	2. Partly inoculated	3258	30	9·2	3	10
	3. Unprotected	10,096	122	12·1	14	11 5
	Total other children	14,536	154	10·6	17	11·0

The ratio of incidence in the fully inoculated to that in unprotected children is 1 : 1·7, but in the preschool group it is 1 : 2·8. Despite a reservation due to smallness of numbers, it would appear that diphtheria confers on the survivors of an attack a high degree of protection against a second attack. There were no deaths from diphtheria in the fully inoculated but the case-mortality of the disease in partly inoculated and unprotected children averaged 11%.

Comparison of the 1943 case-rates in fully inoculated children according to methods and dosage of prophylaxis is bound to be difficult, because the ages of the children in the groups are dissimilar. Nevertheless a [illegible] shows that prophylaxis with APT, employing [illegible] first dose, resulted in a case-rate of 5·1 per 1000, while the TAF technique gave a case-rate of 6·1, and the dosage of 0·1 c.cm. and 0·5 c.cm. of APT was associated with a case-rate of 9·7.

ANALYSIS OF NOTIFIED DIPHTHERIA IN HOSPITAL, 1941–43

This refers to all cases discharged from or dying in hospital during the years in question. The following are the symbols used—F=Fully inoculated (2 APT or 3 TAF), P=Partly inoculated (1 APT, or 1 or 2 TAF), Non=Non-inoculated. *Deaths are given in parentheses.*

Errors of diagnosis.—The percentage of errors of diagnosis has remained for several years fairly constant at about 14% and is similar for protected and unprotected patients.

	F	P	Non
Apparent carriers ..	13	6	32
Tonsillitis	11	3	63
Laryngitis	..	1	8 (1)
Vincent's angina ..	..	..	3
Quinsy	..	..	1
Other conditions ..	1	..	15 (2)
Number revised ..	25	10	122 (3)
Total admitted ..	152	72	860

Some carriers probably had exudate on the tonsils before admission, but they have been included in the revised diagnosis so as to preserve accuracy.

Classification of clinical types.—The categories listed are those suggested by Harries and Mitman (1944), based mainly on the anatomical distribution of membrane.

Of the 127 fully inoculated patients, 28 had received three injections of TAF and 99 two injections of APT; 19 of the latter received one or both injections of the relatively inert toxoid, but these were in no way to be distinguished clinically from the other inoculated patients, nor were 16 who received 0·2 c.cm. and 0·5 c.cm. of APT.

		F	P	Non
Anterior nasal ..			1	[illegible]
Tonsillar ..	mild	2	18	208 (1)
	mod.	11	12	[illegible]
	severe	16	11	80 (2)
Pharyngeal ..	mild	1	1	9
	mod.	1	6	[illegible]
	severe	1	2	54
Nasopharyngeal	mod.	1	2	21
	severe	3 (1)	7 (3)	107 (42)
Laryngeal ..			1	8
Faucial and laryngeal .				15 (3)
Faucial and anterior nasal			1	5
Faucial and vulval .				2
Faucial and labial .				1
Palatal palsy ..		1		
Total cases .. .		127	62	738
Death .. .		1	3	48

The fully inoculated child who died requires a note. A boy of 8 years was inoculated, while evacuated, with APT of good quality, receiving 0·1 c.cm. on July 1, 1941, and 0·3 c.cm. on July 25, 1941. He was admitted on Sept. 20, on the third day of severe nasopharyngeal diphtheria. Membrane covered both tonsils, the fauces, palate, and neck glands being swollen, and there was characteristic fœtor and nasal discharge; 80,000 units of antitoxin was given and a further 60,000 units on the 21st, because of a spread of membrane to the palate. A further spread went on until the 23rd, when there was also nasal and labial excoriation. On the 24th albuminuria commenced and it persisted. The membrane began to disappear, so that the throat was clean by the 28th. On the 29th there were two attacks of vomiting, nasal intonation appeared, the pulse became variable, and the colour pallid. Thereafter there were several attacks of cardiac collapse, attended by cyanosis. By Oct. 2 there was nasal regurgitation, muffling of the voice, and accumulation of mucus in the pharynx. The pulse-rate accelerated to 140 per min. and finally became imperceptible. The boy died on Oct. 4.

The death noted under mild tonsillar diphtheria was due to tuberculous meningitis in convalescence. Making allowance for this, the case-mortality from diphtheria was 0·8% for the fully inoculated, 4·8% for the partly inoculated, and 6·4% for the unprotected.

Follicular distribution of diphtheritic exudate, which was noted by Neubauer (1943) in 21 of a series of 50 cases of diphtheria in the inoculated, was seen in 28 of the foregoing 127 inoculated cases. It also occurred in 82 of the 738 unprotected cases, and apparently reflects the clinical mildness of the disease. The spots have occasionally been observed to coalesce into sheets of membrane later.

Comparative frequency of sy
—The striking feature of this
ordinary mitigation of the
disease as a result of previous inoculation.

		F	P	Non
No. of patients		*127*	*62*	*738*
Albuminuria	transient	5	1	54
	persistent	3	3	72
Cervical adenitis	moderate	24	9	68
	"bullneck" ..	1	10	98
Paralysis	palatal	1	5	40
	pharyngeal ..	1	..	14
	widespread ..	..	1	13
	ocular only ..	..	..	3
Fatal myocarditis		1	3	15
Other cardiac anomalies		6	3	64
Hæmorrhagic forms		..		10
Hemiplegia		..	1	..
Convulsions		..	..	4
Acute nephritis		..	..	3
Jaundice		1	..	3

lbuminuria of persistent type occurred in 2% of the
ully inoculated and ... paralysis
n less than 2% of th ...)% of the
nprotected, while " ... nce in the

inoculated as compared with 13% in the unprotected. It will be noted that the disease in Gateshead in its unmodified form is often of the "hypertoxic" type, and all the "bullneck" cases are given at least 100,000 units of antitoxin promptly on admission. This dosage is based on clinical experience.

FAMILIAL INFECTIONS

An analysis of 23 familial infections in 1941–43 involving fully inoculated and uninoculated members (table II) can be summarised as follows. In 23 families, 25 children with an average age of 8 years, who had been fully inoculated and subsequently infected with *C. diphtheriæ*, yielded 16 carriers and 9 cases, mostly mild and without mortality, while, excepting the aunt and mother, 29 of their unprotected brothers and sisters, of the same average age but with a wider range of years, yielded 4 carriers, 11 mild cases, and 14 severe cases with 4 subsequent deaths.

TABLE II—ANALYSIS OF 23 FAMILIAL INFECTIONS IN 1941–43

Family	Age and particulars of members infected	
	Fully Inoculated	Non-inoculated
W	R 8 Tonsillar carrier	A 8 Mild tonsillar
W	E 9 Tonsillar carrier	K 12 Severe nasopharyngeal
R	I 7 Severe tonsillar	A 12 Mild tonsillar G 9 Severe tonsillar
P	M 8 Tonsillar carrier	M 13 Severe nasopharyngeal
C	D 6 Tonsillar carrier	Aunt 23 Severe tonsillar
M	G 7 Tonsillar carrier V 13 Mild tonsillar	
G	S 11 Palatal palsy	
D	J 1 Tonsillar carrier	
K	J 12 Tonsillar carrier	
H	A 9 Tonsillar carrier	
B	L 9 Nasal carrier	
M	Y 8 Tonsillar carrier	L 5 Severe pharyngeal
H	R 6 Tonsillar carrier	M 2 Severe nasophar. (died)
W	D 7 Tonsillar carrier	C 3 Severe nasophar. with palatal palsy
B	J 8 Tonsillar carrier	M 20 Mild tonsillar
F	L 9 Tonsillar carrier	B 7 Severe phar. and vulval
C	L 11 Tonsillar carrier	M 15 Mild tonsillar
W	W 7 Mild tonsillar	A 13 Tonsillar carrier
S	D 7 Mild tonsillar	G 4 Severe nasopharyngeal (died)
W	J 9 Mod. nasopharyngeal	M 4 Severe nasophar. and laryngeal (died)
N	N 10 Tonsillar carrier M 12 Moderate pharyngeal	E 16 Mild tonsillar
P	D 12 Moderate tonsillar	N 9 Tonsillar carrier W 5 Moderate tonsillar
F	T 8 Mild tonsillar	M 3 Severe nasophar. with pharyngeal palsy C 3 Mild tonsillar

DISCUSSION

Comparison of the incidence of diphtheria in the fully inoculated with that in other children not so treated is [illegible] same in the inoculated as in the others, although under 10 years the annual case-rate in the inoculated ranged from 1·5 to 3 per 1000, as against 11·3 in the others. Nevertheless, other results such as those reported by Anderson (1943), who gives the comparative incidence rates of 0·17 per 1000 in children who were naturally Schick negative, 0·31 in the immunised, and 2·0 in the non-immune, must make us reconsider some aspects of the problem of diphtheria.

In a continuous hospital experience of diphtheria since 1925 in five different towns in Great Britain, I have seen no cases of diphtheria so invasive and toxic as some of these Gateshead cases, apart from one or two very toxic cases in Kettering in 1925. In Gateshead one has often seen extensive membrane accompanie by painless œdema of the fauces and neck glands on t second day of the disease. Nor has treatment wi antitoxin been as satisfactory in Gateshead as pr ously; the false membrane often spreads for tw three days after presumably adequate serotherapy then disintegrates very slowly over a week or l This description tallies with the "malignant dipht reported by Peters (1935) to have been present in since 1920. and that reported by German physicians in 1927 (quoted by Corson 1943). Gebbie and Leete (1935) report an epidemic in Hull in 1931–33 with a large [illegible] severe cases. In some of these the [illegible] to a fatal issue, even with antitoxin on the second day. Leete states that he had to alter his conception of diphtheria, and in searching for the explanation he found that "gravis" organisms were present in 59% of a series of cases in 1932–33. Still later. Leete (1943) reported that there have been two or three waves of the gravis form of diphtheria in Hull, that he has seen diphtheria in high immunes but always modified. and that he believes that any immune may go down with diphtheria when there is a heavy invasion of gravis organisms. Dudley and his co-workers (1934) studied diphtheria in Greenwich Hospital School from 1921 to 1933. After a period of diphtheria prevalence from 1921 to 1928 the school population was kept Schick-negative by immunisation where necessary. Diphtheria practically disappeared until a sharp outbreak, involving 23 cases. occurred in the winter of 1932–33, following the introduction of gravis organisms. All the causal organisms were of this strain in the cases, 21 of whom had been rendered Schick-negative by inoculation. but the clinical picture was that of modified diphtheria.

There can be no doubt that the gravis organisms prevalent in Gateshead belong to the virulent strains associated with hypertoxic or malignant cases of diphtheria. but that is only one of the factors. for there are also variable qualities to be found in the community and individuals attacked by the disease.

In the Greenwich study it is shown that latent immunisation of a community goes on by contact with carriers of virulent bacilli, and Dudley (1934) observes that 3 years' residence in a community where diphtheria is endemic could be accompanied by as high a frequency of Schick conversions as that produced by three injections of toxoid in 3 months. It must therefore be remembered that by 1943 Gateshead children had already been exposed to latent immunisation for 7 years. Many of the apparently unprotected school-children of this study had probably already been immunised by the natural process. and this would account for the poor differentiation of the comparable incidence-rates.

Turning to the clinical comparison of the disease in the contrasted classes. the first disappointment is replaced by well-founded satisfaction with the success of full inoculation in modifying the mortality and toxicity of the disease, which are diminished to a small fraction of that in the unprotected. A study of the familial infections gives point to this view, for here is a clear comparison under conditions usually only reproduced experimentally. The relative failure of *C. diphtheriæ* to produce the disease and its toxic results in the fully inoculated stands in striking antithesis to its effect on the unprotected.

Yet there remains, even in this small series, a paradoxical feature. Some young uninoculated subjects become carriers and some related inoculated persons present the clinical disease, albeit modified. In such instances the failure must be in the individual. The same postulate must also be invoked to explain this disease in 15 second attacks and in 11 Schick-negative nurses in Gateshead during 1941–43. There are some people who are unable to maintain antitoxic immunity at a sufficient level fully to protect against aggressive strains of diphtheria bacilli, although they may, when stimulated by actual infection, quickly produce a response sufficient to counter toxæmia.

CONCLUSION

Gateshead has had a severe outbreak of diphtheria spread over the past 7 years. A campaign of diphtheria prophylaxis has not reduced the prevalence to the extent it was hoped. An analytical study has therefore been made to ascertain the relation of the disease to the diphtheria inoculation procedure. As a result, emphasis is laid on the value of prophylaxis as a modifier of the result of invasion by diphtheria bacilli rather than a preventive of infection. This may appear a pessimistic view when the experience of the nation as a whole is considered, but it is suggested that full prophylaxis reduces the ill effects of invasion by diphtheria bacilli to about a tenth of those in the unprotected. If the prevalent strain of diphtheria organism in a community is aggressive and virulent, as in Gateshead, there will be an appreciable proportion of clinical cases in the inoculated; but these will be modified. On the other hand, if the prevalent bacilli are relatively non-aggressive and non-toxic. as in other parts of the country, the incidence of the disease in the inoculated will be reduced to the exceptional cases, which will then be so mild as to make a diagnosis on clinical grounds uncertain.

An incomplete inoculation course appears to have a negligible influence on the disease.

I have to acknowledge the help of Dr. M. Anderson, resident medical officer, Sheriff Hill Isolation Hospital, Gateshead, in going over the case-sheets with me to compile these tables. The bacteriological typing was carried out by Dr. R. Norton, city bacteriologist, through the courtesy of Dr. J. A. Charles, medical officer of health, Newcastle.

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INADEQUATE TREATMENT OF SYPHILIS *

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In early syphilis, once arsenical treatment on standard lines has been started, it must be continued regularly without major interruption until a minimum of 35–40 injections have been given. Otherwise relapse may follow, and the [illegible] may be even worse after inadequate [illegible] treatment is entirely withheld. The nature of relapse lesions depends to some extent on the amount of treatment given.

It was an early discovery that the results from combined arsenical and heavy metal treatment are better than when an arsenical drug alone is used.

These are among the important points illustrated by the following cases.

CASE 1.—A man, aged 36, was admitted to a military isolation hospital on Nov. 4, 1943, with an ulcer on his chin. He had been exposed to infection with a woman known to have [illegible] examination of serum from the sore [illegible]. Blood Wassermann and Kahn reactions were positive Apart from cervical and submental gland enlargement there were no other signs of disease. Bi-weekly injections of intravenous neoarsphenamine 0·45 gramme and intramuscular bismuth metal suspension 0·2 g. in water were begun at once. After 2 weeks' treatment. when 1·8 g neoarsphenamine and 0·8 g. bismuth had been given, the patient absconded from hospital. He was well. physically and mentally, at this time, and the chancre had healed.

On Jan. 26, 1944, 10 weeks later, he returned to hospital feeling ill. He complained of weakness, malaise, and anorexia, but his chief symptom was occipital headache unrelieved by ordinary measures. He had had no treatment during his period of default. The only abnormal signs were slight neck rigidity and enlargement of the posterior auricular lymph glands. His mental condition had greatly deteriorated, and depression had replaced his original alertness. Blood Wassermann and Kahn reactions were both strongly positive Cerebrospinal fluid findings were: WR positive; globulin in excess; Lange 4555553310; leucocytes 340 per c.mm

Comments.—According to the modified clinical and anatomical classification of Head and Fearnsides[1] this case was one of neuro-recurrence as distinct from syphilitic meningitis and asymptomatic neurosyphilis'—i.e., a more or less purely meningeal neurosyphilis. Clinical evidence of this form is comparatively rare in untreated cases of early syphilis (about 0·3%), and is practically non-existent in adequately treated cases. In cases however in which treatment has been inadequate or interrupted the incidence of neuro recurrence is 2-3%.

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* This article was written a year ago. Since then the treatment of early syphilis in the Army has been modified, and penicillin [illegible] —ED. L.

[1] [illegible] in Moore's Modern Treatment of Syphili

It is generally accepted that a varying degree of immunity to both intrinsic and extrinsic *Sp. pallida*, cellular, humoral, or both, is developed in the infected untreated patient. In early syphilis, treatment may interrupt or destroy this gradually produced resistance, so if treatment is stopped short of complete biological sterilisation the patient is left without adequate defence against the multiplication and dissemination of spirochætes still existing in foci not yet reached by the treponemicidal drugs. The result in this case was neuro-recurrence, which developed typically 8-10 weeks after interruption of antisyphilitic treatment. There was no evidence of optic neuritis, iritis, or ophthalmoplegia, which often accompany neuro-recurrence. The mental strain and physical deterioration resulting from existence as a deserter from the Army may, as noted by many workers, have favoured development of neurosyphilis.

CASE 2.—A man, aged 22, was diagnosed as secondary syphilis on Nov. 27, 1943, at an Allied special centre. He had healing anal condylomata and mucous patches, and his blood Wassermann and Kahn reactions were positive. Treatment was started at once and in seven weeks he was given 4·45 g. of intravenous neoarsphenamine but no heavy metal. On Jan. 27, 1944, he was admitted to hospital with a widespread secondary psoriasiform eruption, said to have begun after the second injection of arsenic and to have increased gradually. The eruption was particularly well marked on the face and palms, and there was superficial ulceration of the tongue with general hyperæmia of the fauces. The primary sore had healed. The last arsenical injection before admission was on Jan. 26. At this time the blood WR was positive. He refused lumbar puncture, but there was no clinical evidence of nervous involvement.

Treatment was with bi-weekly injections of 0·09 g. 'Neohalarsine' intravenously and 0·2 g. bismuth intramuscularly; after two injections of each there was pronounced improvement in the eruption, which gradually disappeared. After 3 weeks the patient was discharged to outpatient treatment.

Comments.—Harrison[2] and others have repeatedly stressed the importance of simultaneous administration of arsenic and bismuth in early syphilis. They claim a lower incidence of early relapse than in cases treated by alternate courses of these drugs. More recently, Belding[3] has shown that in early syphilis the combination of arsenic and bismuth reverses the serological tests more rapidly than does arsenic alone. In case 2 no bismuth was given in the first course, and in spite of regular arsenical therapy mucocutaneous progression occurred. The lesions rapidly disappeared on continued treatment with addition of intramuscular bismuth.

CASE 3.—A man, aged 43, was admitted to hospital in November, 1943, with a generalised pyodermia of about 6 weeks' duration. He gave a past history of secondary syphilis in August, 1938, when a skin eruption followed several months after a penile sore. His blood WR was then positive. He received two courses of neoarsphenamine and bismuth treatment, in all about twenty injections spread over the next 14 months. In November, 1939, the blood Wassermann reaction was negative, and it continued negative when tested at intervals until June, 1943.

On admission there were many small septic ulcers on the trunk and limbs and an area of indolent inflammation and œdema about 2 in. in diameter over the right malar region. The blood Wassermann and Kahn reactions were strongly positive, but there was no abnormality in the cerebrospinal fluid. Before the results of these tests were received, he complained of "rheumatism" of both knees and ankles with pain in both tibiæ. In a few days there was a bilateral synovitis of the knees and tenosynovitis of both achilles tendons. There was also a tender bony swelling on the shaft of the right tibia. X ray of heart and great vessels showed no abnormality, and there were no lesions of the eyes. X ray of the tibiæ showed the left to be normal, but a periostitis with deposition of new bone leaving an obvious boss on the right. Treatment was started again with potassium iodide and bismuth, and later 'Arsenoxide' was introduced. The synovitis subsided in 7 days, and the tibial pain and skin lesions and general condition improved gradually. The patient was discharged in 14 days symptom free, and with only the boss on the right tibia remaining.

Comments.—This case illustrates the allergic inflammatory type of relapse of benign late syphilis with lesions of structures not essential for the maintenance of life or vision—e.g., skin, bone, joints, tendon sheaths. The original treatment for syphilis contracted in 1938 consisted in an inadequate dosage of antisyphilitic drugs given irregularly and intermittently over a period of 15 months. Treatment was discontinued, presumably as a result of misinterpretation of negative serological tests by the patient. The interval between cessation of treatment and clinical relapse in this case was almost 4 years.

SUMMARY

Three cases of early neuro-relapse, mucocutaneous progression in spite of treatment, and late osseocutaneous relapse all resulted from interrupted or inadequate treatment of early syphilis.

They emphasise the importance of regular therapy with arsenic and bismuth, and of persisting with treatment for the standard period in any routine, even though serological negativity has been obtained quite early.

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[2] Harrison, W. *Practitioner* 1931, 126, 193.
[3] Belding, *Amer. J. Syph.* August, 1941.

PRIMARY MUMPS ORCHITIS WITH MENINGITIS

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CLINICAL meningitis is a rare complication of mumps; its incidence varies from 0·15% to 0·5% in different epidemics (Paddock 1932). It usually appears within a week of the parotid swelling but may precede the parotitis or be the sole manifestation of the disease. There are few case-reports of meningitis as the only feature of mumps, and in several instances the diagnosis is open to doubt. This is particularly true of the 4 cases recorded by Howard (1919). Primary mumps orchitis also is uncommon, though Stengel (1930) quoted series of 61 and 84 cases. Harris and Bethel (1938) have reported one case in which the sole manifestations of mumps were meningitis and orchitis. The following case is recorded because of its rarity and unusual features.

CASE-REPORT

A man, aged 18, was admitted to a Naval hospital on June 24, 1942. He had joined the Royal Navy six weeks previously. There was no relevant past medical history; he had never had mumps. He felt well until the 21st, when on parade he suddenly vomited without any previous feeling of nausea or abdominal discomfort. He was seen immediately by a medical officer who could find no abnormal physical signs, and since the patient insisted that he felt quite well he was allowed to carry on with his duties. The same evening he began to feel a little off colour and he vomited again. Next morning he developed mild headache and vomited several times, so was admitted to the sick-bay for observation. On the 23rd, as he was rather drowsy and apathetic, lumbar puncture was performed; the fluid was clear and colourless but contained a large number of lymphocytes.

On admission to hospital next morning his temperature was 101·8° F, pulse-rate 76 per min. He was drowsy and apathetic, but answered intelligently. No parotid swelling. Moderate neck-rigidity. Kernig's sign positive. No other abnormalities were found in the CNS or other systems except fairly numerous extrasystoles, which were not noticed subsequently. No sign of infection of the middle ear, and X rays of the paranasal sinuses and the chest were normal. Blood and cerebrospinal fluid findings are shown in tables I and II. Urinary diastatic index 6·7 (normal for method used); blood-culture sterile; throat and nose swabs grew no pathogenic organisms; Wassermann and Kahn reactions negative in blood and CSF.

The patient's condition remained unchanged until June 28, when his temperature rose to 102·6° F, and he complained of pains in the hips and knees. There was no limitation of movement and no swelling of the joints, but movement of the lower limbs was painful. On the 29th he seemed better in

TABLE I—CEREBROSPINAL FLUID EXAMINATIONS

Date	Pressure (mm. CSF)	Cells (per c.mm.)	Lymphocytes %	Protein (mg. per 100 c.cm.)	Globulin	Sugar (mg. per 100 c.cm.)	Chlorides (mg. per 100 c.cm.)	Gold curve
June 26	250	1300	96	80	Excess	50	710	0000121000
,, 27	160	2300	100	90	Excess	50	720	0000132100
,, 28	160	1380	90	80	Excess	55	700	0000011000
July 5	200	300	100	100	No excess	ND	720	0000110000
,, 11	120	10	100	30	No excess	ND	730	No change
,, 20	110	2	100	30	No excess	50	760	No change

ND = Not done.

Gram stains and culture on blood-agar of all the above specimens revealed no organisms, and guineapig inoculations of specimens 2 and 3 were negative for tubercle bacilli. Subdural inoculation of a rabbit with specimen 4 produced no signs of encephalitis in the animal.

himself and the signs of meningeal irritation were less, but *the temperature rose to 104° F and he complained of severe* pain in the right testicle, which was tender, with tense generalised swelling of testis and epididymis, the groove between the two being just distinguishable. The condition was treated with glycerin and ichthyol locally and a suspensory bandage. This was the only treatment given throughout the whole illness. Next day the testicle was rather more painful, but the patient's general condition was much improved, and *the neck-rigidity had almost gone. On July 1 his temperature* was normal, and the testicle was smaller and less painful. From then on all the symptoms gradually subsided, and by July 14 there were no abnormal signs in the CNS and the genitalia felt normal. At no time was there any swelling of the salivary glands, or of the left testis and epididymis.

TABLE II—LEUCOCYTE COUNTS (per c.mm.)

Date	Total white cells	Polymorphs	Lymphocytes	Monocytes	Eosinophils
June 26	10,200	5814 (57%)	3876 (38%)	510 (5%)	..
July 5	6300	1575 (25%)	4536 (72%)	189 (3%)	..
,, 15	12,300	5781 (47%)	5904 (48%)	492 (4%)	123 (1%)
Aug. 18	6500	2015 (31%)	4225 (65%)	195 (3%)	65 (1%)

On his return from sick-leave on Aug. 15 the patient was quite fit. There was no impotence; he said he had had successful intercourse while on leave. The right testis and epididymis felt normal.

DISCUSSION

The case presented the clinical picture of lymphocytic meningitis and epididymo-orchitis in a young adult. The reasons for attributing the condition to the virus of mumps were the benign course, the blood lymphocytosis, and the symptoms of meningitis, orchitis, and arthralgia; this last is a rare but well-recognised complication of mumps (Rolleston 1932).

French writers (Roux 1914, Urechia 1936, Urechia and Elekes 1936) attach much importance in mumps meningitis to the presence of bradycardia and the absence of vomiting, but in the present case bradycardia was not a feature and the illness was ushered in by violent vomiting. The lymphocytosis in the blood persisting 8 weeks after the acute stages of the disease has not been described in mumps as far as could be ascertained.

In the differential diagnosis the question arises whether orchitis ever complicates the clinical picture of lymphocytic choriomeningitis. The virus of this disease has been demonstrated in the testes of experimentally inoculated monkeys, but no macroscopic changes were discernible in the organs so infected (Armstrong et al. 1936), and no involvement of the testes has been described in the disease in man. Farmer and Janeway (1942) have emphasised the constant occurrence of a polymorph leucocytosis in the blood in the meningeal stage of lymphocytic choriomeningitis; this was at no time present in our case.

Three cases of mumps from the patient's training establishment were admitted to hospital during the 4 weeks before his illness, and although it was not possible to prove that he had been in direct contact with any of these, contact was more than likely.

SUMMARY

A case of lymphocytic meningitis with epididymo-orchitis and arthralgia but without parotid swelling is described and attributed to the virus of mumps.

Unusual features were the sudden onset with vomiting, the pleocytosis in the cerebrospinal fluid, and the persistence of blood lymphocytosis 5 weeks after the subsidence of all symptoms.

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INTUSSUSCEPTION COMPLICATING AMŒBIC DYSENTERY

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ON July 19, 1944, an NCO of an Indian AA battery was admitted to the medical wards of a general hospital complaining of diarrhœa. At about midnight I was called to see him. as he appeared to be having severe abdominal pain, and a lump had been noticed in the upper part of the abdomen. He said he had had a certain amount of diarrhœa since the 17th. On the morning of the 19th, after a disturbed night, he had *noticed mucus and flecks of blood in his stools, had* consequently reported sick, and been admitted to hospital. During the day he had had mild griping pains in the abdomen from time to time, culminating in the passage of a stool and a period of comfort. At about 6 PM. however, the character of the pain changed, becoming continuous with exacerbation at intervals, making him double up. At the same time vomiting had begun, the *stools were less in number—he had passed only 3 in the* six hours that elapsed between the onset of severe pain and the time I saw him—and consisted almost entirely of blood.

The patient was a spare man. The abdomen moved normally on respiration. Through his thin abdominal wall a clearly defined oval swelling was felt above and to the right of the umbilicus; the fingers could be readily inserted *between it and the right costal margin. The swelling* was tender and the size of a cricket ball, and during palpation, the patient being seized with an exacerbation of pain, it was clearly felt to harden. Palpation in the right iliac fossa revealed no positive finding, but no cæcal gurgling could be elicited. Vomiting was forceful, yielding a clear copious vomit. A stool passed shortly after examination consisted of dark blood, containing some mucus but no fæcal matter.

A diagnosis of intussusception was made and the patient advised to undergo operation. This he refused to do, and on the probable consequences of his refusal being explained to him he agreed that if in the morning his commanding officer considered operation necessary then he would certainly allow us to operate! We got into communication with the man's unit. At about 8 AM on the 20th, while his own officer was on his way to the hospital, his pain cleared up, *the abdominal swelling disappeared, the right iliac fossa* felt fuller than it had done, and there was now well-marked gurgling over the cæcum. Vomiting ceased, and the stools became frequent and small, consisted of blood-stained mucus and fæcal matter, and contained vegetative forms of *Entamœba histolytica.* A course of emetine subcutaneously was instituted; the diarrhœa was rapidly controlled and there has been no return of symptoms.

Intussusception rarely complicates amœbic dysentery and spontaneous reduction in such a case must be rare.

I wish to thank Brigadier H. G. Winter, DDMS, Indian Army, for permission to publish this case.

ASYMMETRY OF EXOPHTHALMOS IN ORBITAL TUMOUR AND GRAVES'S DISEASE

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UNILATERAL exophthalmos is usually the most striking sign in orbital tumour It may also be conspicuous in Graves's disease, but here its frequency appears to have been greatly overestimated, probably because of inclusion of cases with simple unilateral lid-retraction. Thus it may be shown by measurement that conspicuous ocular asymmetry rarely occurs in fully developed Graves's disease but in the uncommon ophthalmic forms—those without goitre and hyperthyroidism ‡—it is often found, and owing to the absence of systemic manifestations the true nature of the condition may be overlooked; indeed the orbit has often *been explored in search of a tumour*

It can be shown, however, that the degree of asymmetry in tumour is clearly greater than in this type of Graves's disease, and this is an important differentiating sign. By measuring the extent of asymmetry it is also possible to estimate the bulk of orbital tumours.

METHOD

Orbital tumour material consists of data from 12 patients examined personally and exophthalmometer readings from a series of 9 recorded by Ellett (1911). Ocular asymmetry is compared with that in groups of patients with thyrotoxicosis and ophthalmic forms of Graves's disease. Only ophthalmic forms occurring spontaneously are used for the comparison, since cases developing after thyroidectomy are unlikely to be confused with orbital tumour

The bulk increase in orbital contents corresponding to different degrees of proptosis has been determined by injecting molten wax into the retrobulbar space post mortem, the resulting protrusion of the eye being measured with Hertel's exophthalmometer. Details of the method and results are fully described elsewhere (Rundle and Wilson 1944).

RESULTS

Asymmetry in prominence of eyes.—The table gives the *mean and range of values* for asymmetry in different g [illegible] c [illegible] t [illegible] higher and in orbital tumour higher still.§ Fig. 1 shows data from patients in the last two groups. It appears that 6 mm. may be taken as the approximate upper limit of asymmetry in Graves's disease; this figure is exceeded in over 80% of tumours. Thus a high value for the difference between the two eyes favours the diagnosis of tumour. Tumour growth inevitably tends to produce pronounced asymmetry, but a low difference does not exclude tumour since attendance at hospital may be early—for example, when the growth affects the optic nerve.

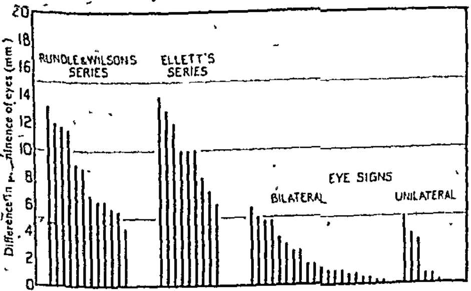

Fig. 1.—A [illegible] prominence in (A) orbital tumour and [illegible]

ASYMMETRY IN PROMINENCE OF THE EYES, MEASURED WITH THE EXOPHTHALMOMETER

Clinical group	Cases	Mean difference and standard deviation (mm.)	Range (mm.)
Normal	62	0·32 ± 0·4	0–2·5
Thyrotoxicosis ..	111	0·51 ± 0·5	0–2·5
Ophthalmic form of Graves's disease	26	2·07 ± 1·7	0·25–5·5
Orbital tumour (combined series)	21	9·09 ± 3·0	4·25–11·0

In Graves's disease, on the other hand, the changes presumably depend on a systemic agent, and when it acts intensely both eyes tend to be affected. But remarkably enough clinical signs may remain unilateral indefinitely, and in such patients up to 5 mm. of asymmetry may be present (fig. 1). This represents a major degree of proptosis in Graves's disease and shows that fairly severe involvement of one eye may occur without any apparent affection of the other. It has been shown in thyrotoxicosis that pathological changes are present in orbital tissues even when eye signs are absent (Rundle and Pochin 1944). Similarly, in clinically unilateral cases, both orbits may be involved, the change on one side merely being too slight to produce signs.

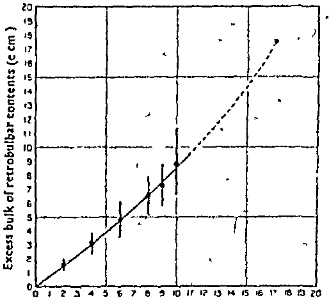

Fig. 2—Bulk increase of retrobulbar contents corresponding to different degrees of proptosis The points *indicate means and the vertical lines standard* deviations from 10 experiments. The gradient of the interrupted continuation of curve was determined in one case only.

Bulk increase in retrobulbar contents.—The ratio between ocular protrusion (mm.) and increase in bulk of orbital contents is expressed by a curve (fig. 2). In its early stages 1 mm. proptosis results from a bulk increase of 0·75 c.cm.; with extreme proptosis the ratio decreases to approximately 1 mm. for every c.cm. Post-mortem measurements demonstrate (Rundle and Pochin 1944) that the prominence of the eye is closely correlated to the degree of orbital filling as determined by the ratio (bulk of retrobulbar tissues): (volume of orbit). The relative bulk of orbital tissues is low when the eye is sunken and raised when it is prominent. The initial pa [illegible] wil [illegible] va [illegible] of [illegible]

From the curve we can deduce that the average volume of tumours in the series was 7·5 c.cm. with an approximate range of 3·3–14·0 c.cm. In ophthalmic forms of Graves's disease, the average bulk excess on one side was 1·6 c.cm. with an upper limit of 4·3 c.cm. *From exophthalmometry and use of this curve we can* estimate the volume of individual orbital tumours and the extent of spread to the orbit of tumours arising in adjacent structures.

CONCLUSIONS

Asymmetry of exophthalmos is rarely pronounced in thyrotoxicosis but is often severe in ophthalmic forms

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of Graves's disease. A value of 6 mm. may be taken as the approximate upper limit of asymmetry in Graves's disease, but this is exceeded in four-fifths of orbital tumours. It is possible. by comparing the proptosis present with that produced by retrobulbar injection of measured volumes of wax, to estimate the size of orbital tumours.

We are grateful to Dr. S. P. Meadows, Mr. Harvey Jackson, and Mr. P. M. Moffatt for referring to us patients relevant to this work.

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RADIOLOGICAL DIAGNOSIS OF MYOCARDIAL INFARCTION

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RADIOLOGISTS have long sought for a graphic record of normal and abnormal cardiac pulsations. realising that such records would be of great value in the diagnosis and prognosis of atypical cases of myocardial infarction. Cineradiography and X-ray kymography have, for various technical reasons, been disappointing. Screen observations have also yielded relatively little information. Parkinson in 1933 regretted that so little had resulted from screen examination. and White (1931). while noting that diminished pulsation of the left cardiac border might indicate myocardial weakness, pointed out that similar diminished pulsation could be seen in many other cardiac abnormalities such as concretio cordis, mitral stenosis, and rotation of the heart.

The development of brighter screens and the use of fine focus tubes with a fine grid for fluoroscopy has vastly improved the screen image, and recent work suggests that infarction can now be diagnosed accurately in a high proportion of cases. Master (1939) describes a local diminution, absence, or reversal of movement of the left ventricular silhouette in the infarcted area, and found one or other of these changes in 66 out of 100 cases of infarction. The abnormal pulsation was commonly noted in the apical or supra-apical portion of the left ventricular outline. Master considered that the abnormality, if visible in the postero-anterior view. represented an anterior or posterior infarct. while if it was seen in the left oblique or lateral view it represented a posterior infarct. In a later paper he concludes that the postero-anterior view will show. in 75% of cases. the altered heart movements which indicate that infarction has occurred, whether it be anterior. posterior. or both. Beck (1939) also describes a diminished amplitude of movement in both types of infarct. Levene and Lowman (1941). in addition to alteration in pulsation, describe a loss of convexity of the left cardiac border in typical cases of infarction. In cases checked by autopsy, they claim 85% accuracy for X-ray screen diagnosis. and 73% correct localisation. whereas the electrocardiographic findings agreed with the autopsy report in 95% and 54% respectively.

In order to estimate the value of the method, 27 patients who had certainly or probably sustained infarcts and 10 controls were examined by fluoroscopy. The screen examination was made without any previous knowledge of the history or clinical or electrocardiographic findings, and since the patients were ushered one after another into a darkened room it was not possible for the observer to be biased by the facies or apparent age of the patients.

The left ventricular border was examined in the postero-anterior view, or with slight rotation to the left, and again in the left anterior oblique, or in such an approximation to it as would secure the clearest view.

No account was taken of an altered heart shape, but diminution, reversal, or absence of pulsation was noted. If one of these was seen in the postero-anterior view an anterior infarct was presumed; if in the left oblique, a posterior infarct was diagnosed. No more accurate localisation than this was attempted. No search was made for auricular infarction. though this may evidently occur in 17% of all cases of infarct (Cushing et al. 1942).

It was later realised that the left oblique view was not the best in which to look for a posterior infarct, for this lesion seems to show itself as often as not in the postero-anterior. Also the greater amplitude of movement normally seen in the left oblique position makes it more difficult to detect local changes. In both views, the apical and supra-apical regions were particularly observed.

The first group consisted of 14 patients with positive clinical evidence of infarction, confirmed by ECG findings with localisation of the site. It is clear from the results compared in the table that the fluoroscopic diagnosis of anterior infarction is accurate. but that both the site and the occurrence of a posterior infarct, are more difficult to define. It seems also that the lapse of time does not affect the possibility of X-ray diagnosis. provided the infarct has been large enough.

The second group consisted of 6 patients with a history of infarct, but in whom the ECG records showed either auricular fibrillation or bundle-branch block. Deductions as to the reliability of fluoroscopic diagnosis cannot be made on such a small number and further observations are desirable. It is obvious that accurate X-ray diagnosis would be of great value in the obscure cases of fibrillation due to infarction.

Group 3 consisted of 7 patients in whom either the history or the EC[illegible]ivocal. This group again shows tha[illegible] is more reliable in anterior lesions, [illegible] are more likely to show convincing ECG findings. It is clear, however. that X-ray diagnosis can be of great value in cases of infarction masquerading as dyspepsia or a biliary attack

RESULTS OF FLUOROSCOPIC DIAGNOSIS COMPARED WITH CLINICAL AND ECG FINDINGS

Group	No. of cases	History	ECG	Time since infarct (yr.)	Fluoroscopic diagnosis			
					Ant.	Post.	Both	Neg
I	9	Positive 9	Q1t1	2/12-7	8	..	..	1
	5	5	Q3T3	8/12-9	1	1	..	3
II	4	Positive 4	BBB (2 common, 1 uncommon, 1 concomitant)	8/12-1	1	..	2	1
	2	2	Aur. fib.	3/12-1	1	..	..	1
III	2	Possible	Probable (T3)	..	1	..	1	..
	2	Probable	Probable (T3)	..	..	1	..	1
	3	Negative	Possible (T1)	..	2	..	..	1
IV	6	Various cardiac abnormalities	Negative	..	1	..	..	5
	4	Normal	Negative	..	..	..	..	4

The fourth group consisted of 6 patients with cardia abnormalities other than infarction and four norma subjects. It was difficult to explain why in this singl case an anterior infarct had been surmised. There wa a slight left ventricular enlargement. but no clinica or electrocardiographic suggestion of infarct. The normals gave no difficulty.

The small experiment seems to show that anterio infarction can be diagnosed and localised accurately by fluoroscopy. The alterations in the movements of the heart seem to be sufficiently pronounced, in most cases to permit of accurate diagnosis. These alterations are probably contributed to by a thickened or adherent pericardium at the site of infarct. It is probably wrong to look for the signs of a posterior infarct in the left anterior oblique position.

If experience by other workers confirms our findings, the fluoroscopic diagnosis of infarction will be a most useful addition to other methods of investigation in the many cases showing inconclusive clinical and ECG evidence.

SUMMARY

Twenty-seven patients with certain or probable myocardial infarction were examined fluoroscopically, without knowledge of either the history or the ECG findings.

In a large proportion of cases in which an anterior infarct had occurred the correct diagnosis was made. In cases of posterior infarct success was limited. In ten control cases, one positive and almost certainly incorrect diagnosis of infarct was made.

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SUDDEN DEATH AFTER INTRAVENOUS NEPTAL

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IN the past three years there have been several sudden deaths after intravenous injection of a mercurial diuretic. In a review of the toxic manifestations associated with mercurials, De Graff and Nadler (1942) show that general reactions of varying severity are not

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the injection of a mercurial and themselves described 6 further cases. The condition of all these patients was such that death was quite unexpected.

CASE-RECORD

A woman, aged 45, was admitted to the Western Infirmary, Glasgow, on Oct. 14, 1941. Five weeks previously she contracted a chill, but thought little of it, staying in bed for a forenoon only. A week later swelling of the face and legs appeared and became progressively worse. No blood was seen in the urine by the patient or her doctor. The past history was not relevant.

On admission the patient was not deemed acutely ill. There was severe general œdema and ascites was present. The heart was not enlarged and the systolic blood-pressure, from admission till the day before death, ranged from 110 to 132 mm. Hg. The fundi, lungs and nervous system were normal. The diet throughout supplied 1800 calories daily with 60 g. of protein and 2–3 g. of sodium chloride. The results of laboratory investigations on blood chemistry and renal function were as follows.

Date	Plasma-proteins (g. per 100 ml.)		Blood-urea (mg. per 100 ml.)	Urea-clearance (% of av. normal)
	Alb.	Glob.		
Oct. 16	1·71	1·69	36·3	87·5
Nov. 7	2·30	2·37	43·4	53·5
Nov. 21	2·20	2·15	53·0	75·0
Dec. 2	1·44	2·29	50·0	85·0

Plasma cholesterol was estimated once, the value being 926 mg. per 100 ml. The urine contained much protein, over 2% on several occasions. Casts were scanty and no red blood corpuscles were observed.

For the first 9 days in hospital treatment was confined to restriction of salt and fluid. During this time the urine was not accurately measured but œdema was considered to have increased because of a gain in weight of 1·0 kg. After a preliminary intravenous injection of 0·5 c.cm. of 'Neptal,' which caused no diuresis, during a period of 13 days six injections of 2 c.cm. were given. At the end of that time 5·0 kg. of weight had been lost and the œdema was much less. On each occasion the neptal was diluted to 10 c.cm. with normal saline and there were no toxic reactions of any kind.

It was then decided to try the effect of urea, and for the next six days no diuretic was given. The urinary output fell and œdema increased, as shown by a gain in weight of 0·9 kg. Urea was then administered in dosage of 10 g. four times a day. At first there was considerable nausea, but this soon passed off, and after 8 days the dose was increased to 15 g. of urea four times a day. Although the mean volume of urine per 24 hours was about double that for the period when no diuretic was being given, œdema progressively increased, as shown by the weight curve. It was accordingly decided to resume treatment with neptal. Urea was stopped and three days later 2 c.cm. of neptal was given in the same manner as the earlier injections. Within a minute the patient became distressed, throwing up her hands and crying out. Respirations became laboured and cyanosis appeared. Within a few seconds a generalised convulsion began, which lasted about 30 seconds. After this she remained unconscious, with stertorous breathing and intense cyanosis. The pulse could not be felt. Death took place about 3 minutes after the start of the injection. Adrenaline, coramine and hot packs applied to the præcordium were ineffective. Permission for an autopsy was not granted.

Treatment	Duration of treatment (days)	Mean vol. of urine per 24 hr. (c.cm.)	Weight (kg.)	
			Start of period	End of period
Neptal ..	13	533	74·1	69·1
No diuretic	6	271	69·1	70·0
Urea ..	17	573	70·0	71·4

Salt restricted throughout. Fluid intake 1200 c.cm. daily.

To summarise, this woman with renal œdema and very low plasma-proteins received six injections of neptal intravenously in 13 days. There were no reactions and fair diuresis was obtained. After an interval of 23 days, treatment with mercurials was resumed and the patient died immediately after the first injection of the second course. It is not considered that the large doses of urea given during the interval between the courses of neptal played any part in the fatal reaction. The sequence of events is in keeping with the view that death is due to an acquired sensitivity to mercury (Tyson 1941). However it should be noted that if this is the explanation of the deaths, sensitivity to mercury must have been acquired otherwise than by injection of a mercurial diuretic in 2 of the 22 recorded cases (Sunderam 1934, Barker et al. 1942), for in these the patient died after the first injection.

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CASE OF RABIES IN MAN

J. G. FITE, M.B. LOND.
MAJOR I.A.M.C.

THE leading article in THE LANCET of Nov. 11, 1944, on the menace of rabies must have been read by many of us who have been abroad with a sense of gratitude to those who framed the quarantine regulations by which the disease has been stamped out in England. It has prompted me to describe the following case of human rabies which occurred in India some years ago and of which I took careful notes at the time.

On Jan. 1, 1939, a number of people were attacked by a mad dog, among them a young Gurkha rifleman aged 19. He had severe lacerations on his left knee and was admitted to hospital. Next morning he and the others who were bitten were put on a course of antirabic treatment consisting of 14 daily injections of 5 c.cm. of antirabic vaccine. On the

on the knee

been killed

On Feb. 16 he was again admitted to hospital with a history of fever and pains in his legs from the hips to the feet for about 24 hours before admission. He also complained of burning pain on micturition and of passing very small quantities of urine at a time. He had been constipated for 3 days. The NCO who brought him to hospital also remarked that he had been unsteady on parade that day.

On admission he had a temperature of 102° F and a pulse-rate of 120 per min. His chest and heart were normal and his nervous system showed no abnormality except sluggish knee-jerks. His bladder was distended up to the umbilicus, there was priapism and a thin serous urethral discharge which contained spermatozoa. His urine was normal and his blood-urea was 54 mg. per 100 c.cm. Soon after admission he passed urine without assistance.

His condition remained stationary for about 24 hours, but on the morning of Feb. 17 deterioration set in. His temperature was now 101° F. His conjunctivæ were congested and he began to vomit his feeds. He was now unable to move his legs and examination of his nervous system revealed absent knee-jerks and abdominal reflexes. His plantar response was flexor and there did not appear to be any sensory changes. His mind was quite clear and he answered any questions that were put to him and was very cooperative. He had by this time become very apprehensive and went into slight generalised convulsions with severe spasms of the face and neck muscles when attempting to drink. He did however complain of thirst. At this stage he was diagnosed as rabies and was isolated. No further attempts were made to feed him by mouth and 10% glucose in normal saline was administered by rectum. He could not pass urine voluntarily and was catheterised when necessary. Morphine gr. ¼ was given and was sufficient to prevent any further spasms for the rest of that day and the following night.

By the next morning, Feb. 18, his condition had greatly deteriorated. He could not speak clearly or answer questions. He moved his hands about purposelessly and was cold and collapsed. Examination revealed a complete flaccid paralysis of the legs with absence of reflexes. The abdominal and arm reflexes were absent. His pupils were unequal, dilated, irregular, and did not react to light. Priapism was still present and had been present throughout the illness. Antishock treatment resulted in a temporary improvement in his general condition, but by 5.30 PM he was comatose. His temperature was subnormal and his pulse-rate 40. Cardiac stimulants had no effect. Cheyne-Stokes respiration set in and he died at 7.15 PM. No autopsy was permitted.

COMMENT

In this case of rabies the main clinical feature was an ascending paralysis of the Landry type. The case is of interest in that the patient was seen immediately after being bitten by a rabid dog and was given a full course of antirabic treatment. There was some doubt at one time during the illness whether the patient was suffering from the Landry type of paralysis which may occur as a rare complication of treatment with antirabic vaccine,[1] but in view of the convulsions on attempting to drink the case was considered to be one of rabies. A report was sent to the Pasteur Institute, Kasauli, which agreed with the diagnosis.

It is to be noted that the five or six other people who were attacked by the same dog, received less severe bites, and were given the same course of antirabic treatment, suffered no ill effects whatsoever.

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[1] See Price's Textbook of the Practice of Medicine, 1942, p. 1588.

Reviews of Books

Textbook of Anæsthetics

(6th ed.) R. J. MINNITT, MD LPOOL, DA, JOHN GILLIES, MC, MB, CH B EDIN., DA. (Livingstone. Pp. 487. 25*s.*)

IN this up-to-date survey of a now important specialty, the authors have made the text useful, not merely to the examinee but to the inexperienced beginner. Accounts of various techniques and instruments are packed with practical details. Sound advice, born of long experience, is given liberally. Particularly good chapters deal with obstetric and endotracheal anæsthesia; and the account of the standard gas-oxygen-ether machines, and the technique used in this country, is probably the best in English. There are, of course, some minor imperfections. It would be rash of a novice to attempt to produce regional anæsthesia after reading the short descriptions given, and a few physiological points also need revision. The authors are ardent advocates of the virtues of rebreathing. That we all thrive on fresh air, and that carbon-dioxide-absorption anæsthesia is widely practised with safety, should surely prove that it is not necessary to breathe carbon dioxide in order to avoid acapnia.

Clinical Laboratory Methods and Diagnosis

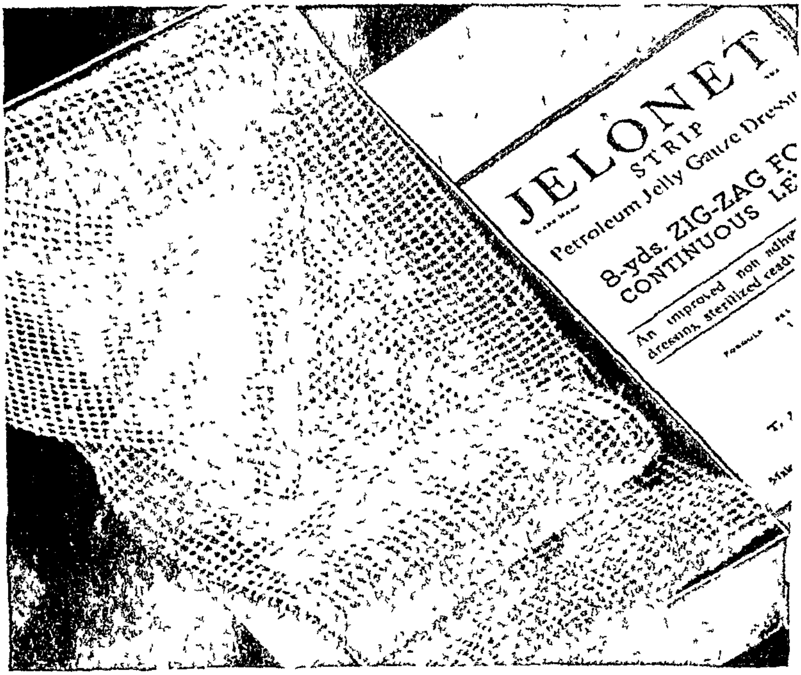
(3rd ed.) R. B. H. GRADWOHL, MD, D SC. (Kimpton. Pp. 2130. 2 vols. £5.)

THE second edition of this well-known textbook was bulky; thanks to additional girth it has undergone binary fission, but even the daughter volumes are large, over 1000 pages each. The first deals with urine, blood chemistry, hæmatology, blood-groups, gastric and duodenal analysis, puncture fluids, and a variety of special tests; volume II covers bacteriology and serology, estimation of basal metabolism, autopsies, histology, forensic medicine, parasitology and tropical medicine. The use of the photo-electric colorimeter is fully described in the new edition, and the section on tests of liver function is new and good. The hippuric acid test is considered to be purely a test of excretory function and not a substitute for the lactose- or galactose-tolerance tests. The section on blood-groups is informative on the Rh factors, and illustrated by instructive diagrams to explain inheritance. The fluorescent technique, in which auramine staining and ultraviolet light are used for the rapid detection of tubercle bacilli, is described in detail, and a new section on vitamin assay and identification is included. An account of penicillin, justly described by the author as terse, occupies a single page. In a section on various pregnancy tests emphasis is laid on the use of *Xenopus* (South African horned toad): Dr. Gradwohl thinks this method has notable advantages if you can get plenty of toads. The section on histological technique is comprehensive, and the chapter on parasitology, including helminthology, has been revised in collaboration with Dr. Pedro Kourí of the University of Havana, with outstandingly good results. The revised section on hæmatology still contains too much doubtful matter; the place of the megaloblast is left uncertain, and colour plates showing this cell are mostly inaccurate. Claims for prognoses in infections based on the "hemogram" give an exaggerated idea of what a blood examination can tell. When giving methods of investigation it is useful to say which is considered best, and what are the special advantages and snags of each; for instance it would be helpful if Dr. Gradwohl indicated which of the five methods of blood-sugar estimation is used in his own laboratory, and why. Laboratory workers will be grateful for this new edition but will probably hope that, in the next, ruthless excision of out-of-date and redundant material will keep down the size of the two volumes.

Psychophysiologische Probleme in der Medizin

Prof. Dr. med. WALTER H. v. WYSS, Chefarzt der innern Abteilung des Krankenhauses Neumünster Zollikerberg, bei Zürich. (Schwabe. Pp. 207. Sw. Frs. 14.)

THIS book attempts to set out a philosophy of human nature from the physician's point of view. Dr. Wyss aims at reconciling the most disparate ideas—the physicochemical interpretation of life with vitalism, body-mind unity with man paramount in nature through his psyche. His eclecticism gives him a broad road. He does not pause before gaps in our knowledge or difficulties in explanation: psychosomatic relations, vegetative and hormonal regulations, which to the ordinary student seem full of snares, fit smoothly into his concept of the whole. Diseases are enemies which the patient is well equipped to fight: he will conquer, unless the problem of his existence seems better met by surrender. The result is a pleasing and comforting picture of man in nature. As for the method by which this harmony is achieved, some translations from the chapters on respiratory, digestive and secretory functions may serve to illustrate the author's point of view: "Respiration is an important medium for expressing affective tension. In it freedom and coercion meet." "Hunger and satiety in man are the equivalents of poverty and possession, of social restlessness and the sense of power." "The mental equivalent of kidney function is reliability and conscientiousness." The physiological facts are up-to-date, sometimes based on the very latest researches; but the book lacks the intellectual responsibility which prevents science from becoming the tool of politicians.



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THE LANCET

LONDON: SATURDAY, JANUARY 13, 1945

Penicillin in Gas-Gangrene

BOTH the incidence and case mortality of gas-gangrene among our land forces in Western Europe have in the first few months since D-day been considerably lower than was anticipated. Credit for the relative success against this most fatal of wound infections belongs to a number of factors which cannot easily be disentangled: rapid evacuation of the wounded, early and radical surgery, penicillin and sulphonamides prophylactically and therapeutically, gas-gangrene antitoxin—all must claim a share in the praise. Yet experienced surgeons agree that the most important single factor in the control and cure of gas-gangrene is still good surgery: thorough removal of dead and devitalised tissue as soon as possible after wounding, and radical excision of infected tissue when gas-gangrene is apparent or suspected. Most of the cases have developed in wounds where the main artery has been divided and the muscles beyond have been ischæmic. In such circumstances early amputation may be the best surgical treatment.

The rôle of penicillin in the prevention and cure of gas-gangrene is not going to be easy to determine. Experimentally penicillin has proved superior to the sulphonamides. Following the encouraging results reported by MCINTOSH and SELBIE,[1] HAC and her associates[2] have tested the therapeutic value of sulphonamides (particularly sulphathiazole and sulphadiazine), tyrothricin, zinc peroxide, and penicillin on experimental gas-gangrene in mice. Infection of muscle was apparent an hour after injection of a culture of *Cl. welchii*, and at this stage penicillin in repeated doses of 5–25 units gave 92–96% cures, whereas sulphadiazine saved 48% and sulphathiazole 20%. The survival-rate with penicillin given three hours after infection was 38%, against only 10% with the sulphonamides. Sulphadiazine was the most effecti [illegible] Neither tyrothricin nor z [illegible] cally, had any therapeutic [illegible], perhaps, the best test animal [illegible] but HAC obtained eq [illegible] in a small series of [illegible] pigs.

In the special penicillin issue of the *British Journal Surgery*, JEFFREY and THOMSON[3] analyse their xperience with penicillin in 33 cases of gas-gangrene in Italy in the spring of 1944. Five of these were men beyond surgical aid when first seen, and although hey were given penicillin and antitoxin all 5 died. Of the remaining 28, 7 died (25%), a case-mortality which compares favourably with the earlier report of MACLENNAN and MACFARLANE[4] when 12 of 35 cases receiving adequate treatment (early surgery, [illegible] died (35%). JEFFREY [illegible] the penicillin in intra- [illegible] 0 units 3-hourly over 3–5 days, the average dosage for the survivors being 370,000 units. They recommend a 3-day course for the case where all devitalised tissue has been removed, but where this is impossible therapy should be continued for 5–10 days. For the shorter course intramuscular injections are probably preferable, while an intramuscular or intravenous drip should be used for the treatment of cases over longer periods. In early trials the intramuscular 'Eudrip' apparatus has unfortunately not proved suitable for field conditions; Army surgeons have found that the daily dose of penicillin is best given by intramuscular drip in 500 c.cm. of saline using the standard transfusion set, and that patients will often coöperate in controlling the rate of flow. JEFFREY and THOMSON were convinced of the value of penicillin in checking the spread of the infection, although clinical improvement was often not obvious until 36 hours after commencement of penicillin therapy. In the fatal cases there was post-mortem evidence of arrest of the gangrenous process with a fibroblastic barrier at the junction of dead and healthy muscle, and death was mostly attributable to other causes—e.g., uræmia, septic bronchopneumonia, myocard [illegible] or secondary hæmorrhage. All their patients [illegible] of course, been given antitoxin therapeutically, [illegible] 10 had had prophylactic polyvalent antit [illegible] doses of 16,500 to 49,500 units. They beli [illegible] under optimal conditions the fatality-rate [illegible] gangrene should not exceed 20%. In [illegible] issue CUTLER and SANDUSKY[5] report [illegible] clostridial infection which developed [illegible] prophylactic use of penicillin. These [illegible] occurred in airmen, and the source [illegible] was probably their flying suits. Some [illegible] showed only localised infection [illegible] whether they were really ca [illegible] modified by penicillin or were [illegible] cellulitis, which according to [illegible] memorandum[6] responds well to [illegible] therapy. The important [illegible] recovered, which encourage [illegible] pro-phylactic penicillin cannot [illegible] least modifies the infection [illegible] posed, by direct attack [illegible] by preventing the [illegible] predispose to gas-gangrene [illegible] ity

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[1] McIntosh, J., Selbie, F. R. *Lancet*, 1942, ii, 750; 1943, i, 793.

[2] Hac, L. R., Hubert, A. C. *J. infect. Dis.* 1943, 74, 150, 161, 164.

[3] Jeffrey, J. S., Thomson, S. *Brit. J. Surg.* 1944, 32, 159.

[4] MacLennan, J. D., Macfarlane, M. G. *Brit. med. J.* 1944, i, [illegible]

Nerve [illegible]

The

"HOMOGRAFTS [illegible] from [illegible] n and individual to [illegible] boroughs to man, for [illegible] of county grafts of [illegible] ea from the of matter [illegible] unty govern- small but [illegible] may not enter- surgery. [illegible] status from everything [illegible] the [illegible] blem of the [illegible] a total [illegible] between [illegible] were [illegible] for [illegible] of [illegible]"

[illegible]

things of it. But if, on the contrary, the surviving cells of the graft itself play a critically important part in securing functional reunion, then we may have to steel ourselves to disappointment.

The only reason for considering nerve homografts is that they offer a possible escape from the principal dilemma of peripheral nerve surgery. Traumatic division of a nerve is never so clean that the divided stumps can be brought together without resection of the damaged ends. If much resection must be done in order to expose "healthy bundles," the stumps cannot be united by suture except under tension, varying in degree with the length of gap to be bridged and the extent of mobilisation. But tension in this situation has a number of undesirable consequences, only one of which is the abnormally dense collagenisation of the nerve[1 2]; and end-to-end suture under tension exchanges new lesions for those it repairs. A second possibility is to use nerve "autografts"—grafts taken from another part of the same individual. But as a rule such grafts are simply not to be found: what nerve, for example, is to be sacrificed if the sciatic or median is to be repaired? If an autograft is contemplated, it can usually only take the form of a cable composed of four or five strands of some relatively unimportant cutaneous nerve; and this introduces a new difficulty, only recently brought to light[3]—namely, that the endoneurial tubes in grafts of cutaneous nerves may be too narrow to allow the effective maturation of large motor fibres. A third possibility is to make use of some variant of *suture à distance*. We have just been told[4] that LISTER suggested such a method—a to-and-fro union of the stumps by parallel strands of fine catgut, which the nerve-fibres are expected (not wholly without reason) to regard in the nature of tramlines. Other such expedients, including tubes and flaps, have been examined and unfavourably reported on by SANDERS.[5] The most up-to-date version of the tube is WEISS's arterial sleeve,[6] though this was designed for sutures in which no very great gap is to be bridged. Their clinical trial is yet to come.

The homograft remains. Here there is no problem of supply, for an amputated leg or fresh cadaver will supply the graft which the patient himself can hardly spare; but over and above the difficulties and drawbacks associated with the use of grafts as such (no doubt principally bound up with the uncertainty or incompleteness of vascularisation, where the grafts are large) the homograft introduces the additional variable of "tissue incompatibility." SANDERS[5] and SANDERS and YOUNG[7] have reviewed the attempts which have been made to use nerve homografts in man and in experimental animals. The results are neither very encouraging nor decisively bad: In rabbits at least,[7 8] it is possible to secure a moderately effective functional recovery of nerves which have been repaired by a homograft bridge 2 cm. long. Moreover, the storage of nerves under petrolatum or in Ringer's solution, first introduced as a measure of convenience (since a donor, alive or recently dead, may not always be to hand), may actually be beneficial. The storage of nerve may progressively thin out the number of living and therefore serologically active ingredients of the foreign nerve, but yet preserve a sufficient num to perform the task of mediation. WEISS[9] has lately carried the technique of storage to its logical conclusion: he believes that snap-frozen and dried nerve grafts preserve the gross and fine morphological properties of nerve although the cells within them are dead. The frozen-dried graft is probably the nearest approach that can be made to a perfect scaffold for nerve union; and if a scaffold is all that is required for the long and wide defects which the nerve surgeon is obliged to repair, the method may have a great future before it.

Recent reports upon the use of fresh, or more or less fresh, human nerve homografts may have given the layman some ground for optimism. It must at once be said, therefore, that some of these reports are either devoid of significance or unreliable. Either they are inadequately documented or the evidence contains the substance of their own refutation—for instance when success is claimed on a basis of as little as three months' follow-up. The matter has now been reinvestigated by SEDDON and HOLMES[10] in a report based on three cases, two of which were treated with fresh homografts, and the third with a homograft stored in Ringer's solution before use. In these no hint of recovery was fc [illegible] of 371, 425, and 573 days. The [illegible] removed and examined histologically. The remain of the two fresh homografts had been grossly colla genised and nothing remained of the original nerve elements. The stored graft had provoked a foreign body reaction and was in process of removal by phagocytes. In summary, the histological report is a death sentence: "there was clearly no sign o even possibility of regeneration." From this SEDDO and HOLMES proceed to ask why nerve homografts are evidently more successful in animals than in man, and their hypothesis, which follows, is to receive experimental investigation. They accept the view[11] that homografts of nerve, as of skin, provoke a active immune reaction, which is preceded by a latent period (during which their behaviour is autograft-like) and which varies in intensity with th quantity of tissue grafted. In homografts of smal animals, the "colonisation" of the graft by nerve fibres from the recipient may take place within th compass of this latent period: the fibres get home so to speak, just before it starts to rain. But wit the long fat homografts of human beings the case otherwise. Here the fibres may be caught half-wa through the graft, when the cellular reaction begi around them. It should be noted that this [illegible] tation does not turn on the phenomenon [illegible] dosage, but purely upon the absolute size, or perha length, of the graft. It leaves open the possibili that a carefully graded extinction of the life of t cells in the graft by storage or by sublethal narco may overcome the difficulty, by reducing the an genic power and effective dosage of the graft, and lengthening the latent period during which behaviour is substantially autograft-like.

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1. Highet, W. B., Holmes, W. *Brit. J. Surg.* 1943, 30, 212.
2. Highet, W. B., Sanders, F. K. *Ibid*, p. 355.
3. Gutmann, E., Sanders, F. K. *J. Physiol.* 1943, 109, 489.
4. Cameron, H. C. *Lancet*, 1944, ii, 833.
5. Sanders, F. K. *Brain*, 1942, 65, 281.
6. Weiss, P. *Arch. Surg.* 1943, 46, 525.
7. Sanders, F. K., Young, J. Z. *J. Anat.* 1942, 76, 143.
8. Gutmann, E., Sanders, F. K. *Brain*, 1942, 65, 373.
9. Weiss, P. *Proc. Soc. exp. Biol., NY*, 1944, 54, 277.
10. Seddon, H. J., Holmes, W. *Surg. Gynec. Obstet.* 1944, 79,
11. Gibson, T., Medawar, P. B. *J. Anat.* 1943, 77, 299; Medaw P. B. *Ibid*, 1944, 78, 176.

Whether SEDDON and HOLMES are right or not, their interpretation illustrates a principle important for the appraisal of experimental results. Nothing could be easier than to summarise the foregoing evidence by saying that homografts are adequate in experimental animals but useless in human beings, and that this only goes to show ("what I have always said," &c.) that experimental surgery on laboratory animals is a waste of everybody's time. On the contrary, they accept the differences between the behaviour of homografts in animals and in man; they believe the differences to be significant, and susceptible of precise analysis; and they believe that the nature of these differences may well provide the clue which will in the long run make it possible to use nerve homografts in human beings

Structure of Local Government

A NEW white-paper on local government in England and Wales during the period of reconstruction is summarised on another page. Its proposals are not decisions, but are put forward in the hope that the legislation which will follow their discussion will be largely agreed, with a resultant strengthening of the framework of local government to bear greater responsibilities and to fulfil new tasks. Emphasis is properly laid on the fact that local government is a living organism, already proved capable of adaptation to meet new conditions and varied responsibilities, and that its success depends on attracting
members and officers, of the
ving them proper scope.
of local government are already heavy. Water, lighting, housing, drainage, scavenging, health, hospitals, and education form the main limbs of a permanent skeleton to which have been added national registration, food rationing, civil defence, evacuation and reception, and the repair of war damage. These many-sided activities have an inescapable bearing on the health and comfort of every citizen, and while there have, on occasion in a few places, been shortcomings, they have on the whole been carried out with an undramatic efficiency. The "town hall," more than ever before, has become a factor in the conscious life of the citizen, particularly in areas which have been the object of enemy attention. It is clear that the period of reconstruction will add to these duties of the local authorities. Town and country planning and the control of new development, vast extensions in the fields of housing, education, and health, and coöperation with the central government in the timing and execution of a programme of capital expenditure to help employment policy, are measures to which the nation is committed—measures whose day-to-day execution will be largely in the hands of the local authorities. In 1941 these bodies had an income and incurred an expenditure in the region of £660 millions[1]; of this huge sum £204 millions came from rates, £226 millions from Government grants, and £233 millions from other sources, mainly trading services. Education expenditure as a result of the new Act will in due course be more than double the pre-war figure, as will expenditure on health—almost all the increase coming from national resources. Facts such as these illustrate the importance of efficient local-government machinery. The white-paper examines the various alternative systems—nationalisation, regionalisation, or a continuation of the present system of counties and county boroughs as the major authorities, with joint authorities for services such as town and country planning and hospital services which require coördination over wider areas. It comes down in favour of the present major authorities, plus joint authorities for the wider services, as the best means of tiding over the reconstruction period; but it adds the warning that the proposals are experimental and that experience "may disclose the need of more radical alteration of the local government structure."

The need for machinery for the adjustment of local-government areas remains. Overspill from towns, the establishment of new industries in hitherto sparsely populated areas, and the decline of established industries and consequent fall of population in other districts all necessitate periodic revision of boundaries. Since 1926 it has been impossible to create new county boroughs, or extend the boundaries of existing county boroughs, except by private Act of Parliament. In counties, since 1929, the county council has had the statutory duty of reviewing county district areas, the decisions being confirmed, with or without modification, by the Minister of Health. The first review had been completed by 1937 and further reviews were to take place at ten-year intervals; but the war led to a statutory suspension of further adjustment of local-government areas. We may expect that in the near future counties will begin their second review and county boroughs will commence proceedings for extending their boundaries. Both types of authority will, meanwhile, be engaged in various forms of planning—on housing, health, and education, for example—without any sure knowledge of the area for which they will be responsible. To avoid this situation the Government propose the establishment of a Local Government Boundary Commission of not more than five commissioners, with the necessary staff, whose duty it will be, subject to certain safeguards, to examine all proposals for boundary adjustment, whether of counties, county boroughs, or county districts. This commission will normally work by reviewing each geographical county and holding a local inquiry on the request of the Minister, the county council, or any county-borough council affected.

The white-paper details two special problems. The first is that of Middlesex, which is entirely urban and in which combinations of the constituent boroughs or urban districts could result in a series of county boroughs which would remove the whole area from the administrative county and destroy the county government. The commissioners, therefore, may not entertain applications for county-borough status from authorities in this county. The second is the problem of local government in London, where two issues arise—namely, whether the boundaries of the county should be extended and whether, within the county, the number and the areas of the 29 boroughs (including the City) and the allocation of functions between the county council and the borough councils are satisfactory. We commented recently on this very complex issue,[2] which the Government proposes to leave to an authoritative body to be specially appointed to "inquire into and advise them on the local government problems *within* the county." The problem of Greater London is shelved in view of the urgency of the problems of reconstruction.

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[1] Ministry of Health Report for year ended March, 1944 (Cmd 6562).

[2] *Lancet*, 1944, ii, 55.

Local government is increasingly run on political lines, candidates for membership being nominated by the local political parties who are also concerned in the election of parliamentary candidates. This means that on issues of local importance great political pressure can be brought to bear on members of Parliament, particularly where the local authorities think alike on any issue. The reactions of local authorities to the Government's proposal that joint health authorities should administer hospital services was vigorously adverse. The present white-paper indicates that the local-government associations were unanimously opposed to the creation of regional authorities. These facts may have influenced the Government in their decision in favour of the present major authorities, together with joint authorities for certain services, as being the most suitable for the period of reconstruction. More radical alterations may prove necessary. But local government like national government, is an art involving th handling of human beings with likes and dislike passions and prejudices. The system of continue responsibility of existing authorities and of boundar revision which is proposed may be a compromis solution to placate the potential opposition of thes authorities, but it is workable and it does remove thi difficult question from the political arena. Area will henceforth be determined by impartial experts i the light of all the evidence and in the light of com munity needs and community services. The expens and the waste of time involved in a full hearing c evidence a second and even a third time by appeal to the Houses of Parliament will be avoided. Th collective needs of civilised communities appear t be given a reasonable chance of collective satisfactio And in the course of time, doctors, who have collec tively foresworn any acceptance of local-authorit control of medical practice, may recognise that, i their sphere also, local government can make a con tribution of value.

Annotations

ACTION AGAINST RHEUMATISM

THE pledge of the Government to provide for every sick person treatment according to his needs has not faltered before the prospect of treating over a million sufferers from rheumatism in England and Wales alone. This is perhaps the most important item in Lord Horder's message in the eighth annual report of the Empire Rheumatism Council.[1] The Minister of Health has, in fact, set up a subcommittee of its medical advisory committee to consider the whole position of rheumatism treatment. Doctors with special knowledge of rheumatism are scarce at present, and the shortage is likely to continue after the war. The Empire Rheumatism Council has established a committee on postgraduate education, with Sir Adolphe Abrahams as chairman. In the council's pamphlet, *Rheumatism: a Plan for National Action*,[2] the fourth edition of which has just appeared, it is suggested that treatment centres and other medical training institutions should train specialists and establish postgraduate courses in rheumatology for general practitioners. The task of grounding the medical student thoroughly in the subject will of course still lie with the teaching schools.

In the annual report Lord Horder also notes that an investigation, admittedly limited, undertaken by Surgeon Commander C. A. Green of the council's naval research foundation, gives no encouragement to the hope that penicillin will be of service in the treatment of rheumatism. Results with the serum prepared by Bogomoletz in the USSR have also proved disappointing, but the quantities available were very small. The establishment of a national chain of treatment centres, advocated in the pamphlet, would do much to advance clinical research as well as to check the inroads of these disabling disorders.

CASTRATION OR ŒSTROGEN THERAPY IN PROSTATIC CANCER?

THE conservative treatment of prostatic cancer, which has become possible through our increased knowledge of hormonal reactions in this disease, can already be regarded as a boon to mankind. It must not yet be inferred that cancer of the prostate can be permanently arrested either by castration or by persistent administration of œstrogen; several years must elapse before any such claim could be justified. But it is certai that in many cases of prostatic cancer symptoms can b temporarily alleviated by castration or the continued us of œstrogen. The purpose of castration in this disease i fundamentally the same as that of giving œstrogen—namely, to reduce the supply of testicular androgen o which the prostate chiefly depends for its activity Many prostatic cancers are sufficiently differentiated t retain in some degree the normal responses to hormona stimulation. For example, they react to androgen, lik the normal prostate, by secreting acid phosphatase. I health, although the prostatic epithelium and semina fluid are rich in acid phosphatase, the enzyme is no found, except in very small quantities, in the blood stream; and this is true also in early cases of prostati cancer. With more extensive growths, especially whe there are metastases in the bones, acid phosphatas usually appears more or less abundantly in the serum where its presence facilitates diagnosis and provide means whereby the progress of the disease may be followed with an approach to exactitude. Apparently the presence of 5 or more units of ac [illegible] 100 c.cm. of blood-serum is almost [illegible] prostatic cancer.[1] Castration, or [illegible] œstrogen, causes an almost immediate drop in the serum phosphatase, whereas androgen causes a prompt increase

Although castration and œstrogens both act largely or entirely by reducing the supply of androgen, they d this in different ways. Castration eliminates the mai source of androgen, while œstrogen arrests its outpu from the testicle by inhibiting the supply of gonado trophin from the pituitary; also œstrogen may perhap act to some extent as a direct antagonist of androgen The effect of œstrogen on the pituitary is temporary an reversible; so continuity of treatment is essential; an some inconveniences are apt to accompany the con tinued taking of œstrogen. If the two methods are no to be used simultaneously, their relative values must b determined. Here a paper by Dean, Woodward, an Twombly[2] is of particular interest, for they have com pared the results in 31 patients with prostatic canc treated by castration with those obtained in 29 patien treated with stilbœstrol in doses of 1 to 5 mg. given b mouth. Both methods of treatment gave immedia and striking benefit; pain disappeared and general we being rapidly improved. These changes were broug

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1. Obtainable from the secretary, Sir Frank Fox, 106, Finchley Road, London, NW3.
2. H. K. Lewis. Pp. 61. 2s.

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1. Sullivan, T. J., Gutman, E. F., Gutman, A. B. *J. Urol.* 1 48, 426.
2. Dean, A. L., Woodward, H. Q., Twombly, G. H. *Surgery,* 16, 169.

about more quickly by castration than by œstrogen therapy. With either method it was not uncommon for symptoms to return after an interval of about 7 or 8 months; and when this happened neither castration nor treatment with œstrogen brought any further improvement. However, such relapse was not invariable, and some of the patients remained free from symptoms for two years or longer. Such an extended arrest of cancer was seen more often in patients treated with stilbœstrol than in those who had been castrated and the former method has therefore been now selected by the authors for routine use.

FEVERS IN EVERY TONGUE

MANY of us find difficulty in interpreting the exact meaning of writers in foreign languages we know fairly well, when it comes to descriptions of communicable [illegible] typhoid, or anthrax. English words [illegible] similar to, the French, Spanish, or [illegible] connote quite different ideas. One has only to look at the word anthrax, which in the original Greek ἄνθραξ means charcoal, but in English a disease due to *B. anthracis*, and in France and Spain a carbuncle or conglomeration of boils. Typhus in France and England stands for exanthematic typhus, while in Germany it means typhoid or enteric fever, sometimes [illegible] ljective "abdominalis." Belgians [illegible] Swiss also call enteric or typhoid [illegible] hen Latin terminology is employed [illegible] e, for Latin names of communicable diseases are subject to different interpretations in different countries. Rubeola at times means measles (Latin, morbilli), at others rubella, röteln or German measles. From this may arise serious complications—a telegram to the Red Cross at Geneva for typhus vaccine, for example, may result in the despatch of typhoid vaccine. Errors in death certification are almost unavoidable.

Dr. Yves Biraud, head of the League of Nations service of epidemiological intelligence, has compiled a volume [illegible] able diseases in Latin [illegible] Dr. Biraud is careful [illegible] mes have not been [illegible] justly, that English is still "one of the national languages of Eire." He does not claim that it is a complete list, and with a wise eye to future editions, invites the collaboration of the reader in supplying names which may have escaped the observation of his assist[illegible] it is the work of [illegible] ous compiler, w[illegible] evident in every [illegible] a godsend to the serious student, however expert a linguist he may be.

THE BATES METHOD

FEW of us would wear spectacles if we could find a way to improve bad sight without them; hence the attraction of the method devised by the late Dr. W. H. Bates is perfectly understandable. The assumptions on which he based his system were set out in a book published in 1920 (*Perfect Sight without Glasses*), and a new edition containing fewer technicalities has now [illegible] nder the less ambitious title *Good Sight with-* [illegible] Bates held that the lens plays no part in [illegible] tion, which he thought was achieved by a shortening of the globe produced by the action of the extra-ocular muscles. Refraction, he held, is constantly [illegible] and errors of refraction are induced by rest- [illegible] or "strain." He considered, moreover, that [illegible] glaucoma, and optic atrophy are also produced [illegible], though of a different type. It followed that he considered glasses unnecessary, in fact harmful: "If the patient does not go on to cataract, glaucoma, or inflammation of the retina he may consider himself fortunate." Bates ignored, of course, much established clinical and experimental work. In denying the rôle of the lens in accommodation he harked back a hundred years or more, supporting his thesis by some rather crude demonstrations on the eye of a fish; though it had already been shown that the mechanism of accommodation in fishes differs from that of mammals. He also denied the action of atropine on the unstriped ciliary muscle, and ascribed its action [illegible] t on the external muscles [illegible] Since atropine acts by [illegible] nerve-endings, it is hard [illegible] opinion. Nor is it easy to accept an experiment in which he claimed to show that accommodation resulted from stimulating the external rectus with an electric current. This effect was abolished when the muscle was cut, but immediately reappeared when the muscle was tied up again, without any interval for regeneration of the injured muscle and nerve. He regarded refractive errors as an expression of mental restlessness, and his remarkably rapid retinoscopies convinced him that the refraction of an eye may vary from emmetropia to 20 D myopia within a second.

But if Bates's physiology and clinical observations are unsatisfactory, his work and that of his followers contains an important lesson. Ophthalmologists have not been sufficiently conscious of the truism that there are none so blind as those who won't see: by confusing the process of seeing with the act of seeing they have been apt to overlook a strong subjective element in their patients' sight. Bates and his followers do not make this particular mistake.

THE NEGLECTFUL PARENT

WHEN parents are punished by imprisonment f[illegible] neglect of [illegible] —where t[illegible] their term, [illegible] prevent them from neglecting the children again when they are released. Imprisonment [illegible] children properly would be more satisfactory. In the *Manchester Guardian* of Jan. 1, Miss M. Artemus-Jones suggests the establishment of small cottage institutions, run on the simplest possible lines, where mothers, taking their children with them, could be taught child care by matrons with practical experience. Neglect, as she points out, is often rooted in mere inefficiency: but the mother who is incompetent to carry out her tasks of cleaning and cooking, and lets things drift, could hardly fail to benefit by simple training in method. The father would be required to contribute to the upkeep of the family while in the training home, and perhaps to clean up the house against their return.

The proposal is attractive, though the cost of the scheme might be substantial. A more serious difficulty would perhaps be to keep the mother in the training-home without some prison-like restrictions, or the threat of prison; and this would mean associating the children with the penal aspect of their case. They could hardly fail to acquire some stigma with their contemporaries. Moreover, during the training period, those of school age would presumably have to go to the school nearest the training-home, thus interrupting their attendance at their usual school. Finally the mother might feel that the father was getting off too lightly. She is to be uprooted from her home and taught her business by a stranger, for which her neighbours will later laugh at her; whereas he gets off with cleaning the house—once.

A start might perhaps be made by giving courses in household management to mothers serving terms of

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1. Polyglot [illegible] diseases: Contribution to [illegible] seases. By Yves Biraud. [illegible] p. 536. 1s

2. T[illegible] out Glasses. William H. [illegible] 6d.)

imprisonment for neglect; and if these proved successful, continuation courses might be offered for the mothers to attend after discharge. Possibly home helps with some training in social work might go for a time to the homes of the discharged women, for a couple of hours daily, to help and teach at the same time. The fathers are a tougher proposition.

CHEMOTHERAPY OF TYPHUS FEVER

It is only five months since the treatment of typhus was discussed in these columns,[1] but already there is more to report. Members of the American Typhus Commission from Cairo[2] record a therapeutic trial of a hitherto unused chemotherapeutic substance, *para*-aminobenzoic acid (paba). Justification for this trial lay in the fact that large amounts of the substance were found to have a therapeutic effect in experimental murine typhus infection in mice, and a definite inhibitory effect on typhus rickettsiæ was also observed in yolk-sac cultures. Furthermore, sulphonamide drugs were thought to have a deleterious action in experimental typhus and it was therefore reasonable to expect that paba, which counteracts the inhibitory action of sulphonamides on bacteria,[3] would exert an effect opposite to that of the sulphonamides. The American report describes the effect of 2-hourly dosage with paba by mouth on the course of louse-borne typhus in 20 Egyptians between the ages of 18 and 48. The total dose of drug varied from 70 to over 200 grammes in individual cases; all but 2 patients began treatment before the end of the seventh day, and 9 of them were treated before or on the fourth day of disease. No harmful effect of these massive doses of paba was observed, the mortality in the 20 treated patients was 10% and the average duration of fever was 12·5 days. Argument is brought forward that the drug exerted an ameliorating influence on the course of the disease, reduced complications, prevented nitrogen retention, and caused an earlier defervescence. Cessation of therapy was sometimes followed by a reappearance of fever though this was not accompanied by other manifestations of typhus infection. Two patients developed a typhus rash while receiving paba, though treated from the second and third days of disease. The observed therapeutic effects were studied against a control background of 44 other patients of similar age-distribution admitted before the end of the first week of the disease to the Commission's wards in the fever hospital, and treated symptomatically. These patients, who were selected for study from the general hospital population, experienced severe attacks of typhus with an average duration of fever of 18·5 days and had a mortality of 18%. Nine of them, of whom 4 died, were admitted to the hospital in alternate fashion to the patients treated with paba, but the remainder were admitted at various times during the epidemics of typhus in 1943 and 1944. No fewer than 44% of these patients exhibited nitrogen retention.

The evidence presented is of the kind most difficult to assess in the whole complex realm of human therapeutics. The results are undoubtedly encouraging, yet the possibility remains, as in any group of patients artificially selected from a series, that the control and treated groups were not strictly comparable and therefore that chance distribution of mild illnesses may have favoured the drug therapy. It is clear that, at the very early stage of disease when treatment was begun, prognosis was impossible. However, all who consult the original paper will agree that unless the Cairo workers were unlucky enough to have selected for treatment patients in whom the prognosis was actually better than the average, their results should lead to further trials, though probably not to orders for paba by the ton.

The same paper mentions the use of penicillin in 4 cases of typhus, and though no conclusions are drawn as to whether this agent modifies the course of typhus itself, it is considered of value in treating secondary bacterial infections. Penicillin has been shown to be of value in experimental murine typhus in mice, but relatively enormous doses were required to affect the outcome of the infection.[4] The value of non-specific supportive therapeutic measures in human typhus is stressed in a paper by Woodward and Bland[5] which deals largely with the cardiovascular system in typhus. The circulatory failure, which is so prominent a feature of the disease, is thought to be due predominantly to peripheral vascular rather than to myocardial failure. Adequate fluid intake, parenteral fluids by subcutaneous or intravenous routes, and even human plasma are all regarded as essential in the treatment of typhus, and these, unlike specific remedies such as paba, can be applied even after the first week of the disease at a time when many patients first arrive at the hospital. Their relative impotence in the face of grave typhus is, however, clear from the figures for patients treated symptomatically in the Typhus Commission's ward in Cairo.

EFFORT SYNDROME AND GRAVES'S DISEASE

Interest in the effort syndrome, or Da Costa's syndrome, has fallen off since 1941, judging by the numbers of papers published on it. We are still in the dark as to its ætiology, however, and Moschcowitz and Bernstein[6] would like to identify it with what they describe as the larval, or constitutional, phase of Graves's disease. Superficially their case is convincing, provided that the biological concept of Graves's disease is valid. They consider that Graves's disease "is not a nosological entity in the sense that it has a well-defined group of signs and symptoms and a constant background in morbid anatomy," but rather a series of diseases [illegible] from a larval stage to the final classical picture [illegible] scribed in the textbooks. This thesis is not new [illegible] mooted during the last war—but added knowledge has strengthened the case. Symptoms and signs in effort syndrome are identical in many respects with those of Graves's disease, and differences ar [illegible] in the florid stage. The basal [illegible] usually said to be normal in effort sy [illegible] often accepted as an important poin [illegible] diagnosis. But in the larval stage of Graves's disease too the BMR is usually normal; and if a patient suspected of having effort syndrome is found to have a raised BMR the diagnosis is usually changed to Graves's disease. Again, enlargement of the thyroid gland is not uncommon in effort syndrome; whereas in the early stages of Graves's disease, and even sometimes in well-developed cases, the gland may not be appreciably enlarged. True, few records exist of florid Graves's disease having developed in patients known to have effort syndrome: *in the only follow-up of any size that has been reported, no case of Graves's disease wa*[illegible] in the 665 patients investigated.[7] It might be [illegible] however, that a man boarded out of the force [illegible] much of his cause for anxiety and hence is li [illegible] improve; Cohn,[8] inspecting base hospitals a week after the armistice of 1918, found only a few cases of the effort syndrome where previously they had been numerous. Moschcowitz and Bernstein give records of 11 cases in which the transition from effort syndrome to florid Graves's disease seems to be well established. While their case cannot be accepted as proved, its further study may provide a means of reconciling the conflicting views of psychologists and physicians.

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[1] *Lancet*, 1944, ii, 214.
[2] Yeomans, A., Snyder, J. C., Murray, E. S., Zarafonetis, C. J. D., Ecke, R. S. *J. Amer. med. Ass.* 1944, 126, 349.
[3] Woods, D. D. *Brit. J. exp. Path.* 1940, 21, 74.
[4] Moragues, V., Pinkerton, H., Greiff, D. *J. exp. Med.* 1944, 79, 431.
[5] Woodward, T. E., Bland, E. F. *J. Amer. med. Ass.* 1944, 126, 287.
[6] Moschcowitz, E., Bernstein, S. S. *Amer. Heart J.* 1944, 28, 177.
[7] Grant, R. T. *Heart*, 1925, 12, 121.
[8] Cohn, A. E. *Amer. J. med. Sci.* 1919, 163, 453.

Special Articles

HOSPITAL FOOD

I. WHAT IS WRONG WITH HOSPITAL DIET?

HOSPITAL diet is poor because menus are monotonous, because food is badly cooked, and sometimes scanty. This is an old story: but how did it ever come to be told? There must be some fundamental reason for the low standard of feeding in many hospitals which in other respects give a high standard of care for patients.

BIRTH OF A BAD HABIT

The history of provision of care for the sick gives some clue to the anomaly, for the feeding of patients is closely allied to the history of nursing. Nursing developed under the au[illegible] guiding principle was charity; [illegible] the sick and the poor, and in [illegible] food and alms. [illegible] were destroyed, [illegible] time there was [illegible] ened again they were no longer under the auspi[illegible] the Church, and then it was that nursing sank to its lowest level, and nurses were drawn from the poorest class of women. The standard of living of the poor was so low that no-one troubled much about their feeding in hospital: it was left to the poor and sometimes degraded women who nursed them. Yet a few hospital authorities gave a little thought to it.

At St. Bartholomew's, for example, in 1687 a new diet was agreed upon, and in 1715 the diet was improved. Little importance was attached to food as a means of restoring health, however, for a ruling in 1744 decrees "that patients are to lose their dinner on any Sunday or holiday that they do not go to Church." That the medical profession had some jurisdiction is evident from the statement, in 1755, that "the physicians may order pudding instead of meat."

The reforms begun by Florence Nightingale towards the end of the nineteenth century, and still continuing today, [illegible] improvement in the service of meals to the [illegible]: but nutritional values were still not studied [illegible]ously. Moreover, though it became the duty of the matron to supervise the diet, the purchase of food was never entrusted to her, and she had no power to [illegible] id to the kitchen staff or [illegible] hen. Her task was, and [illegible] the food bought by the hospital, and cooked by the hospital cooks.

THE PATIENT'S GRIEVANCE

The basis for the diet in many hospitals before the war was one main meal a day: for the rest of the day patients had to depend on food brought in by relatives and friends. The list of things which patients were asked to bring with them into hospital included such items as butter, eggs, sugar, and in some instances tea. This [illegible] hospitals were purely [illegible] merely at subsistence [illegible] ts pay, and pay well, [illegible] right to expect to be [illegible] well in return. Rationing has provided sound reasons for altering the old practice. The patient hands over his or her ration books to the hospitals and may justly expect [illegible] in the country—unless, [illegible] Yet we repeatedly [illegible] only part of their [illegible] et, from the patient's point of view, are multiple. Not only is the food often poorly cooked, and generally rather cold, but there is little weekly variety and seldom any choice of dishes. If only one cooked meal a day is served (which is quite often the case), supplemented by an uncooked breakfast and tea, the actual quantity of food offered may be insufficient to satisfy appetite. Finally nearly every meal is taken in a hurry. No sooner have the nurses brought the plates round than they are fretting to clear them away again, and get on with the next job—a round of bedpans. The situation is an awkward one: clearly it is not a good plan to be taking round bedpans while people are eating, so the two events cannot be allowed to overlap. The other cause of a rush at mealtimes is, of course, shortage of staff.

THE DOCTOR'S GRIEVANCE

The doctor might criticise the diet on all these grounds and on others besides. He will feel strongly that a hungry patient should almost always be fed according to appetite; and he should be even more critical when a patient with a poor appetite is offered insipid or even repellent food. "Light diet" in hospital is apt to be monotonous in type and meagre in quantity, especially in war-time. We have only to think of the food a good wife or mother will provide in the home for the sick husband or child who "fancies something light," to realise that a piece of steamed fish and some rice pudding, bleakly served on chilly plates, are not what the doctor ordered. Again, in hospitals where there is no dietitian, patients on special diets often complain that they are given foods which are obviously wrong or offered in the wrong quantities. The patient on a roughage-free diet, for example, may be brought a plate heaped with cabbage, and if he has a simple and trusting character he may eat it. If he protests he may acquire a reputation for faddiness, always punished severely by busy nurses. We have heard of a man [illegible] was offered a se[illegible] vegetables. Fo[illegible] it; but such a wrong beginning might have spoiled his chances of ever learning to digest again with his diminished gastric mucosa. In such cases, as in lawn-tennis, a good beginning is half the battle. There are many reports, too, of diabetics given the wrong food, of children with cœliac disease given the wrong quantities, and of patients of all kinds going hungry because they could not fancy their food.

If, as sometimes happens, a patient receives his food from the hands of a different nurse every day—almost every meal, it may seem to him—he cannot hope to impress each one with a sympathetic regard for his likes and dislikes. Nor are the nurses in a position to help him much. They can only serve him with what comes up from the kitchen, and at the speed which routine demands. The student nurse, during her preliminary training, learns invalid cookery and is taught how to make a tray attractive with clean linen and a nosegay. She rarely uses that technique again, unless she takes up private nursing. In the wards she is told "we haven't time for all that kind of thing." Even if she had the time, she would usually [illegible] trays to go round, let [illegible] it is worth noting tha[illegible] same.

WHO BEARS THE BLAME?

Where does the responsibility lie for all these drawbacks? Unfortunately it is scattered among several parties. For a sparse and monotonous diet, the committee first, abetted—often unwillingly—by the steward and matron, must usually take the blame. There are still some institutions where the menu is drawn up by a house-committee, governed in their choice of food more by financial than by nutritional requirements: but in most institutions it is the responsibility of the matron and may be planned by her or by the housekeeping sister—and neither of them m[illegible] diet with sufficient variety, or [illegible] pleasing diversity of treatment [illegible] to economise on the quantities purchased, and often fails to take advantage of the day-to-day opportunities of the market. There are excuses for all: the steward's committee may be urging him to cut down expenses; the matron and her assistants, suffering under the same parsimony, may be handicapped by having an inadequate and poorly paid kitchen staff. Both forms of economy are thoroughly bad.

It is apparently the exception rather than the rule for hospital cooks to taste the food before it leaves the kitchen; yet no cook worth her cooking-salt would leave a dish untasted in her own home. But apart from staffing defects, kitchen equipment is often out-of-date, inadequate, or otherwise defective. We have heard of one large EMS hospital where the daily kitchen staff habitually take in their own vegetable knives because there are not enough to go round. Again, methods of serving may be poor. Meat may be sliced an hour or more before it is needed and then be left on a hot-plate, getting drier and tougher, till the time comes to take it to the wards. Or carving may be done unskilfully by nurses, kitchen-maids, or porters, so that ragged fragments appear on the plates, and much food is wasted. Green vegetables may be cooked too long, with the result that their vitamin content is destroyed; and they are often inadequately drained. Potatoes may be carelessly peeled, blackened spots and "eyes" appearing in them. Rice-pudding, monotonous at any time, may be watery, flavourless, and short of sugar. Too little ingenuity and time may be spent in making a cold tea- or supper-dish look attractive. A slab of corned beef and two lettuce leaves is not a salad dish for a sick person. Sad suet pudding would tax the digestion of a schoolboy. Strong tea may be agreeable to old people but is disgusting to children.

Food may be cold when it reaches patients because it is transported along draughty corridors on old-fashioned open trolleys, instead of in the heated trolleys which were available long before the war. The trolleys, moreover, may be loaded up by porters who are cheerful and willing enough, but who have very casual ideas on cleanliness and hygiene. A container without a lid—holding potatoes say—may be covered by another container taken up off the floor. Minor delays en route may be overlooked as trivial, the trolley being left standing in a chilly corridor while the porter waits for a free lift or unloads the trolley at a ward. These things happen even in well-disciplined hospitals: porters cannot spend their lives weighing advantages and disadvantages to patients; that is not their job, but the job of doctors, nurses, and the hospital committee.

Some of these defects can be corrected by a clever and imaginative ward sister. She can serve the helpings neatly and elegantly; she can slice that corned beef finely and arrange it in a pattern; she can chop up the lettuce, decorate it with some slices of tomato, serve the salad cream in a small clean jug. Granted she can do all this if she has time, if she has imagination, and if she is that increasingly rare bird, a born nurse. Sometimes she is not, and more often she is tired, harassed, and short of adequate help. To a woman in that state even the most reasonable request of a patient becomes a piece of presumption. We have heard of a patient who asked that her lunch-time rice pudding might be put by and given her at tea-time. "Certainly not" was the reply to that; "she won't want it then." Which of us, if sick in our own homes, would be denied such a moderate indulgence? But, again, the most patient person cannot work miracles. If the food, which comes up from the kitchen is chilly, monotonous, and badly cooked, the best service in the world could not make it appetising. If there is no choice, the ward sister cannot tempt a capricious appetite.

A SUMMING-UP

In the main the hospitals may be blamed for two cardinal faults in their approach to the subject of diet: they have failed to appreciate the importance of correct feeding, and most of them have failed to place the responsibility for catering in the hands of a single experienced officer with sufficient influence to stake out a fair claim on the hospital income. But we, as doctors, are primarily to blame for not insisting that the needs of our patients are properly met.

The prescribing of diets is a part of treatment, and should remain so. The interpretation of the prescription must continue to be the responsibility of the ward sister, who knows the likes and dislikes of the individual patients. But while the buying of food is the responsibility of one officer, and the cooking the responsibility of another, and the distribution perhaps of a third, it is not possible to achieve a high uniform standard throughout hospital feeding. The result of this lack of unified control displays itself in many hospitals in:

1. Failure to provide adequate meals throughout the

2. Inexpert buying, and failure to use food obtainable in the open market.

3. Lack of sufficient skilled kitchen staff, [illegible] poor variety, careless seasoning and garnishi[illegible] absence of sauces, and the spoiling of good [illegible] cooking.

4. Out-of-date equipment for cooking and service, and lack of labour-saving devices.

MEDICINE AND THE LAW

Dispensary not a "Hospital"

Mr. Alfred Ford of Solihull, dying in 1941, left property worth £174,000, and directed by his will that his residuary estate be held in trust for division equally among the voluntary hospitals of Birmingham and Solihull, and two other named institutions. In preliminary proceedings in the Chancery Division the court ordered an inquiry to identify the voluntary hospitals in the two areas specified. The result was a list of 16 hospitals. The Birmingham General Dispensary, not included in the list, petitioned to be inserted as a 17th participant. Mr. Justice Vaisey, giving judgment on the application on Dec. 19, reluctantly ruled against it. He paid full tribute to the applicant institution, its merits, and its admirable administration. It had been founded by voluntary contributions in 1793 and was not conducted for profit. It had 11 branches, including dental and massage departments, and casualty clinics. During 1943 it treated no fewer than 29,916 patients. It had a full-time medical, dental, and pharmaceutical staff, with consultants in almost every branch of surgery and medicine. But was it a "hospital"? The judge regretfully felt that the ordinary meaning of the word compelled him to answer "No." In the English language "hospital" signified a building where inpatients were received, not a casual dispensary. The casualty clinics were set up to treat minor industrial injuries and ailments hitherto treated only at hospitals. He thought that if anyone were asked to give a list of the hospitals in Birmingham, it would not occur to them to include these 11 separate branches: the totality of them did not justify their being called a "hospital."

The 16 successful claimants had no wish to exclude the Birmingham General Dispensary, but had no authority to relinquish any part of their shares to an institution not entitled to participate in Mr. [illegible] Perhaps some future testator will [illegible] recognise the claims of the dispensary.

Bogus Practitioners

The offence of masquerading as a qualified medical practitioner naturally varies in its punishment according to the circumstances of the case. Thus David Meirion Gray Davies, aged 30, pleading guilty to two offences before the Llanelly magistrates, was fined a total of £50 with £5 11*s.* 6*d.* costs. On the strength of his assertion that he was a "triple conjoint," he was engaged as locum tenens by a doctor who was going on holiday. The suspicions of the secretary to the insurance committee at Carmarthen were aroused, and Davies was questioned about his qualifications. He replied that he was a registered practitioner. Later he admitted that this was false. He had attended a [illegible] from tuberculosis. She died, and he ma[illegible] certificate in which he attached to his signature the qualifications MRCS, LRCP. The two offences consisted of falsely pretending to hold these qualifications and making a false certificate for the purpose of death registration. When interviewed by the police, the accused stated that he had been a medical student at Charing Cross Hospital from 1934 to 1938 when he took the premedical examination of the Conjoint Board and also the examinations in anatomy and physiology. From there he went up, he said, to the Royal Colleges at Edinburgh, intending to complete his finals. The rest of his story showed a curious domestic dilemma. The war intervened. His mother fell ill and he could not leave her: if he had qualified, he would have been called up: he therefore decided not to take his finals. On the other hand he had to pretend to his parents "as their financial position was by this time not too good," that he had successfully qualified. The Llanelly doctor, he said, came to his house to ask him to act as locum tenens; his father, believing him to be qualified, persuaded him to take the appointment. The case illustrates afresh the ease with which unregistered persons can assert that they are registered, and the need for vigilance in checking an applicant's qualifications.

Another recent instance from Scotland, where the defence aroused less sympathy, ended in imprisonment. Robert Hamilton Deans, aged 30, posing as a doctor "attached to the Canadian secret service," was sent to prison for 12 months on eleven admitted charges. The offences included posing as a registered practitioner, fraud, and bigamy. Deans was stated to have charged big fees for treating patients for months. Fees of £100, £30, and 10 guineas were mentioned. It was said that he had obtained at least £200 by his frauds.

SURGICAL BELTS

THE Board of Trade is still receiving a large number of wrongly worded certificates supporting claims for surgical belts and corsets. Manufacturers can now supply these against a single medical certificate giving the date, the patient's name and address, the condition from which he is suffering, and the doctor's name and address. Where necessary a description of the garment required should be enclosed. The following list of approved conditions covers most of the cases which require a surgical belt or corset:

Abdominal diseases

Severe enteroptosis
Severe gastroptosis
Ventral hernia
Severe visceroptosis

Diseases and injuries of the spine

Actinomycosis
Arthritis deformans
Carcinoma
Dislocation
Fibrocystic disease
Fracture
Fracture-dislocation
Osteochondritis juvenilis dorsi
Osteomalacia
Osteomyelitis
Sacro-iliac disease
Spondylitis
Tuberculosis

Deformities

Kyphosis
Lordosis
Scoliosis
Spondylolisthesis

Diseases of the nervous system

Cerebral diplegia
Muscular atrophy
Muscular dystrophy
Paralysis of abdominal muscles
Paralysis of spinal muscles
Spinal neurosis

Diseases of the breast

Acute mastitis
Chronic mastitis

Conditions requiring a belt with pad, cup, chute, disc, plate or metal frame, after operation for:

Appendicostomy
Cæcostomy
Cholecystostomy
Colostomy
Cystostomy
Gastrostomy
Ileostomy
Jejunostomy
Nephrostomy
Ureterostomy

If a surgical corset is needed by a patient suffering from some other disability, a fuller medical certificate should be sent to the Board of Trade giving sufficient detail to make clear to the medical advisers of the Ministry of Health or the Department of Health for Scotland (one of these departments will be consulted in all such cases) the precise nature of the disability. If the doctor does not wish to disclose the patient's condition, the certificate should be sent to the Ministry of Health,[1] or in Scotland [illegible] Department of Health for Scotland,[2] [illegible] document containing the patient's [illegible] of the type of [illegible] manufacturer. Th[illegible] Ministry or Department of Health as confidential. On the recommendation of their medical advisers the Board of Trade will endorse the second document and return it to the patient, who will use it to obtain a surgical corset in the normal way.

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[1] Supplies Division, Whitehall, London, SW1.
[2] Supplies Branch, 23, Eglinton Crescent, Edinburgh, 12.

Reconstruction

LOCAL GOVERNMENT

FOLLOWING discussions [illegible] tions, the Government hav[illegible] post-war period in a whit[illegible] *England and Wales during the Period of Reconstruction* (Cmd 6579, HMSO, pp. 20. 4d.). This begins with a tribute to the flexibility and adaptability which local authorities have shown in the war years, refers to the importance of capacity and public spirit in officers and members, and declares the object of its proposals to be the strengthening of the framework of local government to bear greater burdens and fulfil new tasks.

At present county boroughs are completely self-governing communities, whereas in counties there is a two-tier system; county councils, in addition to performing certain functions themselves, also having supervisory and coördinating powers over duties carried out by the county districts. This fact, together with the absence of desire in local-government circles for any recasting [illegible] led for such a [illegible] of the Govern[illegible] briefly examin[illegible] They consist in nationalisation, regionalisation, and the creation of joint authorities for planning or executive purposes.

POSSIBLE ALTERNATIVE SYSTEMS

The white-paper notes the wide fears of a growing tendency to transfer loc[illegible] State. In fact, the only [illegible] decade concern mainte[illegible] employed, the suppleme[illegible] pensions, the national veterinary service, the national agricultural advisory service, and functions relating to milk production on farms. Under contemplation for national administration are extensions of the trunk road system, some residual public-assistance functions, the fire service, and some public-utility services now fortuitously private or public as regards administration. While not prepared to rule out the possibility of transferring other functions to State control if the case is sufficiently strong, the Government are in general opposed to the policy of transferring services essentially local.

Nor do they favour the creation of regional authorities, directly elected to administer services over wide areas. Apart from the unanimous opposition of the local-authority associations to such a step, it would involve a two-tier system in county boroughs and possibly a three-tier system in counties. The regional commissioner system is also to go, with the consequent removal of some popular misapprehensions. It was never designed to alter the local-government system but to meet conditions which might interrupt communications between the seat of the government and the rest of the country.

There remain, however, various services (of which hospitals are a notable example) where coördination between two or more areas is essential. For these the Government favour an extension of the established procedure of joint boards or joint committees. These are not directly elected; their financing by precept may discourage a due regard for ways and means; it is not satisfactory to divorce planning from execution; and as the field for their work is more widely recognised they may multiply excessively. Nevertheless, the difficulties are not so great as to delay the working out of the reconstruction programme, nor is ultimate integration of joint bodies in any area ruled out.

LOCAL GOVERNMENT FINANCE

Education, housing, health services, and the reconstruction of war-damaged cities and towns will, in the future, all require increased expenditure at enhanced cost in the form of higher wages, salaries, and prices [illegible] who [illegible] but some [illegible] increase is incalculable at present, but it will be of the order of £10 millions for education and £7·5 millions for health services. Local financial burdens are mitigated by the central government in the following three ways.

internal oblique above and external to the internal ring, encircles the fascia, and emerges through the internal oblique in the reverse direction at a point near its entrance, and is tied there. This method, published 32 years ago, seems to be superior to the one I suggested in the *British Journal of Surgery* of October, 1943.

Dec 31, 1944. HAROLD C. EDWARDS.

HOSPITAL FOOD

SIR,—This company has for three or four years undertaken the entire catering at the Royal Hampshire Hospital, Winchester, under contract. This was entered into at the request of the hospital authorities, and we are pleased to state that complete satisfaction has been obtained throughout the period.

By employing a qualified firm with catering knowledge and an organisation to deal with the many difficulties inseparable from food matters, the staff and patients are enjoying well-balanced meals and a variety of dishes hitherto unknown. The cost to the hospital is certainly not greater than that under the former method—in all probability rather less—with greater satisfaction all round.

J. OSWALD ROOKE,
Managing Director.
The Mecca Cafés.

IMPREGNATION VERSUS INSECTS

SIR,—In your annotation of Nov. 18, 1944 (p. 663), you describe some of the achievements with new insecticides during the present war, especially with DDT. I believe it is too early yet to state categorically whether DDT is as effective in destroying adult mosquitoes in houses as it is against lice in clothing. If eventually DDT or any other preparation be found which is 100% effective, it will obviously be of the greatest service to man.

Over 30 years ago General Gorgas advocated the destruction of mosquitoes in houses in the Panama Canal Zone as a very important measure in the fight against yellow fever. Samuel Darling agreed, but pointed out that to be effective the spraying must destroy *all* the mosquitoes in the treated room, not merely disperse them. The spraying of rooms with a repellent or an only partially effective insecticide may do more harm than good. Repeated reinfections do not influence the severity of the disease. Therefore it is better to leave the mosquito to feed in the room where the occupants have probably contracted the disease rather than drive it into rooms of non-infected people. In countries where malaria is sporadic, and even in poverty-stricken regions where malaria is endemic, the regular use of a cheap and really satisfactory insecticide would do much to reduce the incidence of the disease.

Several house-haunting species of *Anopheles* survive for many months, spending the greater part of their lives inside houses. The *atroparvus, labranchiæ, elutus,* all three members of the *maculipennis* group, become sexually liberated towards the end of the summer but continue to feed greedily every 48 hours for many weeks well into the late autumn. In autumn, moreover, the natural death-rate of these insects is much lower than during the active breeding season, when they are less protected from their natural enemies and many are drowned in the process of egg-laying. Some of my recent experiments produce the following results: (1) The salivary glands of a heavily infected *Anopheles maculipennis* may contain over 135,000 sporozoites: (2) after twenty separate blood meals over a period of forty days the salivary glands may still contain over 20,000 sporozoites. In nature, such heavily infected insects may, providing they feed only on man, cause at least twenty cases of malaria. The killing of one such insect would be far more important than destroying large numbers of larvæ, which as adults may never become infected or even feed on man.

In post-war eastern Europe a cheap insecticide, safe, easy of application, really effective against mosquitoes in houses, would be of the utmost value.

Ministry of Health Malaria
Laboratory, Epsom.
P. G. SHUTE.

ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS.—A meeting will be held in Birmingham on Thursday and Friday, Jan. 25 and 26. Visits will be paid to iron foundries, and at 2.30 PM on the 26th, at the Birmingham Accident Hospital, Dr. G. F. [illegible] will speak on health in iron foundries.

In England Now

A Running Commentary by Peripatetic Correspondents

THE troubles in liberated countries, said the Archpsych, are due to the fact that a man who has been C-in-C of a group, tossing for the torture chamber twice a week, is not going to be bossed even by a well-elected gent who's been playing dominoes in London. There has been a very strenuous [illegible] but it's been by ordeal and c[illegible]. Food and security are not enough for these men now; they must have self-expression and its comparative and superlative, self-importance and power, as well. That's fundamental [illegible]. Listen to the wireless and note how [illegible] ot of preen after every performance; [illegible] re you can watch a unit of huma[illegible] Church, WI, Legion, Chapel, Scouts, Guides, all with their heirarchies, sorting themselves out in order of powerfulness; the Table of Precedence itself is simply an attempt to stabilise the "peck order" round the throne. If we want to avoid trouble in this country we must realise that there has been an election going on for five years, an election by merit and character, and that every possible position from seats on parish councils to seats in Parliament should be made available to those who have been successful in it.

Politically democracy is an equality of opportunity, but biologically it should be an equality of function too. Probably the best thing we could do when we suck the half-time lemons after the defeat of Germany would be to have a great turn over and as [illegible] practically possible make the civilians soldiers and soldiers civilians, from FM Montgomery and FM Churchill downwards. (Voice: What about you?) "I," said the Archpsych with dignity, "although I have an overweening conviction that no-one has quite my penetrating understanding of the inner workings of humanity, I shall follow my own dictum and shall apply for a job as dermatologist in the army against Japan" (cheers).

* * *

"Paint me as I am," shouted Oliver Cromwell to the young artist, "warts and all." It is the fault of George Borodin, the author of *Red Surgeon* (London: Museum Press. Pp. 274. 15*s.*) that he fashions the to[illegible] hero—no warts, no scars, no wrinkles—and thu[illegible] him unreal. The story begins with the simple [illegible] worth thought, "the child is father of the man [illegible]. Red Surgeon is pictured first as the little boy [illegible] a beetle with infinite gentleness to avoid hurting it; at the sight of a rabbit in pain his eyes blaze, his face whitens, and his temple pulses visibly race. The boy fights to rescue the animal from some other youths, and then tends to the animal indifferent to his own blood falling drop by drop "like a miniature rain-shower." Most unreal; I am sure most surgeons, even the very distinguished, delighted in tying the tin can to the cat's tail and watching its antics, poked and annoyed the little dog, bird's-nested, and even trapped if they got a chance, like the rest of us. There was no real thought of hurt in their hearts, it was just like the game of teasing and catching out their own fellows. Most laymen picture the surgeon with long strong graceful fingers, and the Red Surgeon is thus equipped. Actually, the surgeon's hands differ but little from other hands; they may be short and stubby or long and tapering. Like the heroes in this war, as we have learnt, there is no pattern. I have seen small heroes, tall ones, fat ones, and even bald ones. To garb the Red Surgeon even more adequately he is born of a father who dies early for the Revolutionary cause. It must be very rare for the Revolutionary to beget a leading Revolutionary son. Who knows aught about Lenin's father, Stalin's, Karl Marx's or even Hitler's (except his name)? One little wrinkle above all I missed in this Red Surgeon's make-up. Not until well over forty does his heart do cartwheels for any woman. I just don't believe that about surgeons. At any rate in this country, hospital matrons have a surprising appreciation of the surgeon's temperament, for almost invariably it is a pretty girl and one sharp of tongue that swirls her gown in the surgeon's court. The Red Surgeon in the midst of battle falls in love with a beautiful lady physician; and here the author gives away the purpose of the book when he says 'she symbolised Russia." Working during the day, sniping night, she hated with the fury of a woman the German invader. The story ends with the young lady physician fighting furiously in battle, "handing death to the invader"; then a sniper's bullet ends her life, the Red Surgeon is blinded and loses both arms.

This book is an excuse for propaganda about Russia. But Russia needs no propaganda. Her living deeds speak for themselves, and to build the story of her heroism and sacrifices around a rather unreal hero does scant justice to her. To illustrate the book there are some propaganda pictures, frozen corpses, skeletons, and battered little children. Other horrors by the Nazis, some of which are beyond belief or described; the carving of the swastika on an old woman's breast, the burying of children upright up to their necks and then stampeding horses across them. Undoubtedly the personal horrible small incident shocks and stirs, and these pictures are thus of some purpose. We are anæsthetic to mass figures and words like "5 million dead" glide easily off the tongue. Borodin reckons that the British are poor haters; that may be true, but propaganda milk needs to be very good if it is to make that cat into a tiger.

* * *

I recently came across the following phrase in an American medical journal: "The dull routine of the daily after-breakfast visit . . ." which set me thinking that for some of us the war has changed all that.

It was pleasant to sit in the little roofless wooden hut which the RE's in September, 1939, set up in a corner of the orchard in which our tents were pitched. A red-backed shrike started to build in a neighbouring tree next spring, and I would spend hours with my binoculars there. Two schools of thought arose at the onset, but I sided with that which held that hats should not be worn in such circumstances. It was unfortunately the duty as well as the joy of the farmer's boy to remove the

he did from behind and without warning.

Monsieur" was palpably insincere.

Middle East, where, in what was then

camp in the world, things were so planned

than 200 yards from a

proportion of us usually

was no mean hazard on a

slit trenches to surmount.

eight seats (compartments

sely encircled with sacking

our to confine to each of these units its proper quota of flies. It was in Iraq and Persia that we first got to know the "Squatter." This

r Hindu dependants results in a

ition, but has its difficulties. The

with rush matting which permits of sufficient infiltration by the rare local breezes to obviate the necessity for signposting, even on the darkest of nights. A further hazard in the shape of unfriendly scorpions resulted in two casualties.

On arrival in Malta we became joyfully aware of the presence of water-closets. Our joy was modified however on finding that, owing to the bombing, there was no longer any plumbing attached. We reverted to the deep trench as to an old friend. In Sicily we returned to nature for a period, owing to a lack of available RE's or tools. It is doubtful anyway if either could have been of much assistance, since nowhere was rock more than 8 inches beneath the surface. This was quite fun at first (there were bushes), but soon it became an offence to heaven, and a period of voluntary constipation became fashionable, to avoid intimate contact with what was probably the heaviest fly offensive of the war. This stage lasted for several weeks, and æsthetic

in fact never established.

La Belle France—centre of all things

lance precariously along a 20 ft. pole

a bottomless pit. It is very sociable,

derance in our diet of the excellent

nders our visits rare. It is rumoured that no case of peritonitis has yet occurred as the result

of

isit to a prisoner-

of

the biggest and

be

ndercarriage. It would have delighted the author of that little classic "The Specialist." Every seat was occupied, and a medical orderly was on watch at one end for signs of dysentery.

Obituary

CHARLES FERRIER WALTERS

F R C S

Of late years Bristol surgeons have known Charles

on to the Royal Infirmary, as

er, and many will recall his

ed as they arrived in hospitals

of his life had been spent in

from the London Hospital in

once to undertake a long series of house appointments at the Royal Infirmary and the Royal Hospital for Sick Women and Children. Having gained his fellowship in 1901 he was appointed to the BRI surgical staff; and he also demonstrated physiology in the medical school. During the war of 1914–18 he served in France at an emergency hospital and was one of the authors of an important paper, published in this journal in 1917, on 500 emergency operations for abdominal wounds. A surgeon of wide scope, he also wrote on intramedullary bone-pegging of fractures at a time when this was a novelty; he was on the staff of the Bristol Lock Hospital and was a leading spirit in starting the St. Brenda's nursing-home for semi-private patients. Rising in due course to senior surgeon at the Royal Infirmary he won the affection of many generations of students.

"Walters was renowned for punctuality and rapidity," writes A. W. A.: "during a list of operations, he was apt to be halfway through the next before his house-surgeon joined him. But he was more than a hustling surgeon; a man of catholic interests, he would weigh in with apt contributions to discussions on philosophy and metaphysics. He was never happier, however, than when wrestling with the mysteries of his monster car; or building a snug cottage for his family out of the local clay in the combe he had discovered for himself on the Bristol Channel. Here 'Piggy' welcomed house-surgeons and nurses, and some of us remember, many autumns ago, a grand bonfire of the shrubs and light timber cleared for the foundations."

Mr. Walters died on Christmas Eve, at the age of 69. His widow survives him with their daughter and an only son now serving in the RAMC.

THEOPHILUS NICHOLAS KELYNACK

M D VICT., M R C P

Dr. Kelynack, who died on Dec. 23, was a son of the Rev. N. Kelynack, and was born at Wells, Somerset, in 1866. After preparatory education he proceeded to University College School in its old premises in Gower Street—a school which has produced a goodly number of eminent medical practitioners. Forsaking London, he took his professional course at Owens College, Manchester, graduating MB with distinction in 1889, and MD with the gold medal in 1893. His early days of professional life were spent holding various appointments in the Royal Infirmary of Manchester, where he soon became pathologist and medical registrar; here he showed his keenness in pathology, and closely studied the vermiform appendix, publishing a valuable work on the pathology of that organ. He showed also his ability as a teacher and was appointed an assistant lecturer

Lafayett

then professor of

, he obtained the

t Vernon Hospital.

with the study and

tion there and his energetic research into all aspects of infection with the tubercle bacillus enabled him to become a recognised expert, and he wrote much which was highly useful on this disease, all too prevalent in those days. He was a skilled editor of the *British Journal of Tuberculosis* for 27 years, and also of the periodical *Child* from

1910 to 1927. His aptitude for dealing with the infections of childhood also led him to accept, and to be of great help in, the posts of physician to the Sanatorium for Tuberculous Children, and medical adviser to the National Children's Home and Orphanage, and to the Shaftesbury Society. He found time to act as a justice of the peace for the county of London, and carried out his duties with that thoroughness for which he was renowned. But he was not content with the above activities, and perhaps he will be best remembered by his close study of, and writing upon, the subject of alcoholism and other drug addictions. He was editor of the *British Journal of Inebriety*, under the control of the Society for the Study of Inebriety, for no less than 38 years, also acting as hon. secretary to the society for a long period. His work, *Drink Problem of Today*, has become a classic, and his numerous papers on the subject have been scattered over the world. He was elected a vice-president of the society in 1941, an honour which gave him considerable pleasure.

He married Violet McLaren, herself an MB, and well known in the Medical Women's Federation. Their only child, Agnes, has followed them in the medical profession, and is now on the secretariat of the British Medical Association.

W. McA. E.

On Active Service

CASUALTIES

WOUNDED OR INJURED

Surgeon Lieutenant K. V. J. Kearney, MB NUI, RNVR
Captain K. M. Bell, MB ABERD., RAMC
Captain Alan Lyell, MB CAMB., RAMC
Captain D. J. Tibbs, MB LOND., RAMC
Captain J. P. Weiss, LRCPE, RAMC

AWARDS

MC

Captain K. B. Fraser, MB ABERD., RAMC

AFC

Squadron-Leader Samuel Davidson, FRCSE
Squadron-Leader E. A. G. Goldie, MB CAMB.

MENTIONED IN DESPATCHES

Air Vice Marshal F. C. Cowtan, CB, KHS

Air Commodore F. J. Murphy.

Group-Captains: J. D. Leahy, MC, R. H. Stanbridge, A. F. Cook, R. L. C. Fisher, R. G. James, F. E. Lipscomb.

Wing-Commanders. F. G. Mundell, R. Thorpe, J. G. L. Brown, J. R. Cellars, D. J. Dawson, H. A. Graham, J. F. MacCarthy, A. Muir, J. St. C. Polson, J. B. Ross, J. G. Stewart, C. Wollaston, J. L. Brown, D. M. Wallace, OBE

Squadron-Leaders. K. G. Bergin, P. M. Davies, L. D. A. Hussey, J. M. Kerr, M. L. Maley, A. T. M. Roberts, D. Skinner, W. H. C. Spooner, C. Bucknall, R. H. Carpenter, G. Clayton, C. V. Gledhill, J. Guthrie, T. A. Hale Monro, D. W. Higson, W. L. James, A. D. Messent, E. J. G. Murray, T. H. Redfern, C. O. Ribeiro, D. C. Russell, O. Scarborough, W. B. Waterfall, J. H. P. Gauvain (killed 14/8/44).

Flight-Lieutenants. D. Laing, W. J. Lynd, W. R. K. M. Parry, F. S. Rickards, J. E. Sharpley, A. C. Smerdon; J. G. Burgess, A. Standeven, P. W. G. Sutton, L. A. Sylvester, J. Taylor, R. G. M. Wedderburn, J. H. Wilkins, J. A. J. Wiseman.

Flying-Officer.—H. T. Foot.

MEMOIRS

Fionne

Major Arthur Waymouth, news of whose death in India on Nov. 10 has been received, was born in 1913, the only child of Mr. J. K. Waymouth of Westcliff-on-Sea. He was educated at Uppingham School, and Downing College, Cambridge, and at both he gained his rugby colours. He took his MA degree and the conjoint qualification in 1941, but he joined the RAMC before completing his MB final. His clinical work was done at St. Bartholomew's Hospital and he held several house-appointments there before he joined up. He sailed for India at the beginning of 1942 and was attached to a field ambulance of the 14th Army. He was mentioned in despatches for his work as leader of an expedition sent to rescue refugees from Schwinbyan, when the party was cut off from supplies of food and water for a fortnight. At the time of his death Waymouth held the rank of major, but he had already acted as a lieut.-colonel and his commanding officer, impressed by his ability, cheerfulness, and power of getting things done, had marked him for early promotion. A fellow of the Zoological Society, he was an authority on tropical fish and had contributed several articles on this subject to the *Aquari*[illegible] He was also a keen boxer and [illegible] in yacht races. He married Miss June [illegible] had one daughter.

Captain Philip Robinson, who d[illegible] on Nov. 10, was born in Trinidad [illegible] he came to England and was educated at Stowe and Trinity College, Cambridge. He spent his years of clinical study at the Middlesex Hospital and after qualifying MRCS in 1935 acted for two years as demonstrator in anatomy. "When I came to Middlesex in the autumn of 1937," writes J. K., "it was my great fortune to find an excellent team of demonstrators who had already given good service to my predecessor, Prof. Thomas Yeates. Philip Robinson was the youngest member of this group but his place in the affectionate esteem of the students was already secure. His skill in dissection, and the facility with which he explained the apparently difficult and made it easy to understand because he himself thoroughly understood it, made him an ideal demonstrator. In him the students found a champion who could ease their burdens by winnowing the chaff and laying bare the essentials of a matter to the exclusion of [illegible] minutiæ and detail. He had an alert mind and [illegible] share with others the facts which he himself had [illegible] in his clinical work." One of his fellow demonstrators [illegible] his jovial teaching and graceful manners and adds: "Robbie was an inspiration; not content with what the book says, he worked very hard to clarify, for instance, the perplexities of the layers of lumbar fascia as exposed in a nephrectomy; if you have tried it you will understand the difficulties. His exposition of the development of the pericardium was masterly. It is assumed in most dissecting-rooms that the demonstrator is recognised by the Gray tucked under his arm: Robbie was distinguished by forceps and scalpel."

Robinson's goal was the final fellowship and this would have been quickly reached but for the outbreak of war. On D-day, as an RMO, he landed with his men on the Normandy beach-head, and five months later he was still with them when the shell which killed him exploded on his [illegible] aid-post. "In the assault and in our hard battle [illegible] Caen," writes his Colonel, "Philip was magnificent. He was always at his post ready for whatever happened. In the early difficult days he was an inspiration to me. . . . He was fearless, kind, and understanding, and thoughtful of the comfort and safety of others."

"Robinson's work in my surgical service," writes G. G.-T., "was characterised by the same enthusiasm and excellence that he had displayed in every previous appointment and sphere of activity. After he joined the RAMC, chance occasionally brought us together for a few brief moments in the south-east corner of England, and as the war went on and the years slipped past, there was no self-pity, no repine that he had not yet attained the surgical diplomas which might have put a specialist post within his grasp. He was content to serve his fellow men in the battlefront, and he died as he had lived, true to the Virgilian motto of the hospital that cradled him."

Captain Robinson married Miss Kitty Pope and they had one son.

The following appointments have been made in the healt[illegible] division of Unrra:

Colonel V. P. Sydenstricker to be chief nutritional adviser [illegible] the health division in the European regional office. Dr. Syde[illegible]stricker is professor of medicine at the University Hospital, August[illegible] Georgia, USA, and during 1942 as a member of the Rockefell[illegible] Foundation health commission carried out a survey of nutrition [illegible] health in England on behalf of the Ministry of Health.

Lieut.-Colonel T. B. Layton, DSO, to be distri[illegible] to the mission to Italy. Mr. Layton is surgeon in [illegible] nose and throat department of Guy's Hospital.

Dr. E. C. Ben[illegible] he mission. Dr. Ben[illegible] superintendent [illegible] and lectures in infecti[illegible] diseases at the [illegible]

Dr. J. A. Fitzgerald to be camp medical officer to the missi[illegible] Dr. Fitzgerald, who has served in the Colonial Medical Service [illegible] West Africa, has lately been employed by the Ministry of Health [illegible] nutrition surveys in this country.

Notes and News

OLD FOLKS NOT YET AT HOME

The London County Council have been considering one-room flats for old people, but owing to the urgent need of homes for larger families, only 581 such flats have been provided out of 95,740 dwellings. Some are in blocks, while others are in special two-story buildings—containing both one- and two-room flats—on cottage estates.

The Council feel that old people should not be segregated but should keep touch with the life of the neighbourhood. For those who are able-bodied they hope to provide more flats of the kinds described, but for those who need some help different provision is needed. It would be possible, the Council think, to ensure for each of these a semi-independent life in a separate room on certain housing estates where there are to be special communal cooking and bathing facilities. These tenants would be under the general care of a resident woman supervisor provided by the social welfare committee. Any so infirm that they needed institutional care would be looked after in small buildings on the lines of the Council's present homes for the aged, managed by the social-welfare committee. It is thought that these resident homes should be situated on the housing estates where the semi-independent old people are living: the staff of the institution could then help these old tenants with their housework, or in other ways.

One-room dwellings are relatively costly to build. In 1938 it was estimated that, after allowing for the cost of the land, and assuming that the average weekly rent would be *3s. 4d.*, the deficiency would be £19 per flat per year for 40 years. The Council has approached the Ministry of Health to find out what subsidies will be allowed, and whether further powers will be required to make the services of institutional staffs available to old people living in flats and needing occasional help with their household work. Once they are reassured on this point, they hope to go ahead with providing accommodation on the lines suggested.

FILMS FROM THE USSR

Four films from the Soviet Union were shown privately at the Torch Cinema recently to an attentive audience. One of these (*Revival of Organisms*) has already been reviewed in our columns (*Lancet*, 1942, ii, 383).

Academician Pavlov is a combination of two older films. It shows Pavlov at work, and his surroundings. From his initial experiments on conditioned reflexes in dogs we are taken on to his study of chimpanzees when faced with problems, and their behaviour is amusing as well as interesting. This film will be useful for semimedical audiences, and as a filler for more specialised programmes.

Rehabilitative Surgery is a long film dealing with nerve injuries and surgical repair. It falls into four parts: the first shows various types of nerve lesion in diagram; the second shows the clinical appearances of different nerve lesions of the limb, and is the best part of the film; the third demonstrates surgical repair as carried out in Russia; and the fourth shows—not very convincingly—the end-results of the [illegible] The pictorial quality is poor, with the [illegible] the screen all the time. The running [illegible] English.

[illegible] is a short film recorded by a news-reel [illegible] ration for removal of a piece of shrapnel [illegible]. It is a striking record, for the patient [illegible] walking out of the hospital at the end. [illegible] ary is being prepared.

The four films can be obtained from the Soviet Film Agency, 5, Kensington Palace Gardens, W8. Since they have sound tracks they cannot be used on a silent projector.

ADVICE BEFORE AND AFTER MARRIAGE

The Marriage Guidance Council held its annual general meeting recently at the Caxton Hall, Westminster. The report for the past year noted that membership has doubled, that new branches have been formed in the provinces, and that the London centre had dealt with 650 cases. Extension of the work has been somewhat hindered by lack of funds and [illegible] meeting, preparation for, [illegible] cussed from the medical, [illegible] oints of view. The value [illegible] n engaged couples and a doctor was explained by Dr. Lilias Jeffries. Dr. Edward Griffith reported cases illustrating the help which can be given to couples in difficulties, and Mr. Claud Mullins, as a magistrate, reaffirmed his belief in the value of conciliation by trained and sympathetic officers before a couple in disagreement appeared in court. Once there, the case cannot be considered from its human aspect, but can only be argued on its legal basis.

AN AFRICAN MISSION

Dr. Albert Schweitzer, philosopher, organist, and surgeon, who turns 70 on Jan. 14, comes from Upper Alsace. He began his work at Lambaréné, on the banks of the Ogowe River, in 1914, in a disused fowl-house. His hospital now consists of some fifty buildings, and he has been treating the negro population of the region since that time. Before the war he used to [illegible] furloughs given [illegible] In these ways [illegible] Africa. The bulletin of his hospital council, in a special birthday issue, tells how he came home in 1939 for one of these dynamic holidays. Threats of war met him, and fearing lest he might be separated from the people he serves, he hurried straight back to them without unpacking. Since then he has been continuously at work in Africa. A list of the sums sent by his friends and admirers to support his undertaking show what sympathy this has inspired. The treasurer of the council may be addressed at 5, Castleton Mansions, London, SW13.

University of Oxford

On Dec. 16 the degree of DM was conferred on Celia K Westropp.

Royal College of Physicians

On Tuesday and Thursday, Jan. 16 and 18, at 2.30 PM, Lieut.-Colonel C. H. Stuart-Harris will deliver the Goulstonian lectures at the college, Pall Mall East, SW1. His subject is to be influenza epidemics and the influenza viruses.

Mr. Desmond MacCarthy, LL D, will deliver the Lloyd Roberts lecture at the college on Tuesday, Jan. 30, at 3 PM. He is to speak on psychology in literature.

Royal Society of Medicine

Sir Arthur MacNalty has been elected president of the history of medicine section in succession to the late Dr. J. F. Halls Dally.

A meeting of the fellows of the society will be held at 1, Wimpole Street, London, W1, on Tuesday, Jan. 16, at 5 PM. On Jan. 19, at the section of obstetrics and gynæcology, Prof. A. St. G. Huggett and Dr. J. J. Pritchard will speak on experimental fœtal death. On the same day, at 6.30 PM, at the section of radiology Dr. C. L. Sutherland and Dr. A. W. Fawcett will open a discussion on industrial lung diseases.

Tuberculosis Association

[illegible] Portland Place, London, W1, [illegible] Dr. E. T. Fletcher will speak [illegible] tuberculosis, Dr. R. B. Illing on chronic miliary tuberculosis in children, and Dr. M. C. Wilkinson on resistance in tuberculosis.

British Institute of Radiology

On Thursday, Jan. 18, at 8 PM, at 32, Welbeck Street, London, W1, Mr. T. Pomfret Kilner, FRCS, Mr. Stevenson Clark, Miss Shaw, and Mr. F. W. Coppin will take part in a symposium on clinical photography. Medical members of the institute will meet the following day at 5 PM.

Therapeutic Research Corporation of Great Britain

The following officers have been elected for 1945:

[illegible]

Order of St. John of Jerusalem

The King has sanctioned the following promotions in, and appointments to, this order:

[illegible]

British Dental Association

Today, Saturday, Jan. 13, at 2.30 PM, the industrial dental officers' division will hold their inaugural meeting at 13, Hill Street, London, W1. Sir Alfred Webb-Johnson, PRCS, will speak, and members of the medical profession will be welcome.

Eugenics Society

On Tuesday, Jan. 16, at 5 PM, at the rooms of the Royal Society, Burlington House, Piccadilly, London, W1, Mr. Cecil Binney will speak on eugenics and criminal law.

Red Army Flag Day

The Joint Committee for Soviet Aid is to hold a flag day in the Greater London Area on Red Army Day, Feb. 23, to help to provide rehabilitation equipment for the Russian wounded.

The Salmon Lectures

Brigadier J. R. Rees, consulting psychiatrist to the British Army, delivered the Thomas W. Salmon lectures at the New York Academy of Medicine on Nov. 20–22.

Royal Society of Tropical Medicine and Hygiene

A meeting will be held at 26, Portland Place, London, W1, on Thursday, Jan. 18, at 3 PM, when Brigadier N. Hamilton Fairley, FRS, will speak on chemotherapeutic suppression and prophylaxis in malaria.

Andrew Graham Ritchie Bursary Fund

The friends of the late Dr. A. G. Ritchie are raising a fund in his memory, the income of which is to be applied to providing a bursary in the faculty of medicine of the University of Edinburgh. Preference will be given to sons and daughters of doctors. Contributions should be sent to Miss Norah Macfarlane, 57, Fountainhall Road, Edinburgh, 9, or to Miss Grace Alison, 46, Heriot Row, Edinburgh, 3.

Ophthalmological Society of the United Kingdom

The annual congress of the society will be held on Friday and Saturday, April 13 and 14, at 1, Wimpole Street, London, W1. The subjects chosen for discussion are the ocular sequelæ of head injuries, and plastic repair of the lids. Further information from Mr. Frank Law (hon. secretary), 36, Devonshire Place, W1.

Whole Blood from USA

Whole blood collected in San Francisco, Oakland, and Los Angeles is now being flown across the Pacific, packed in ice. Over 200 pints a day is now being called for to make the 3-day flight. Whole blood collected in New York, Boston, and Washington crosses the Atlantic within 24 hours for use in Europe.

US Army Medical Department

It was announced on Nov. 30 that the present strength of the medical department of the United States Army is 680,891. The total includes about 15,000 in the dental corps, 2000 in the veterinary corps, 15,000 in the medical administrative corps, 40,000 in the army nurse corps, and 1334 hospital dietitians.

Postgraduate Lectures at Edinburgh

The following Honyman Gillespie lectures will be given at the Edinburgh Royal Infirmary on Thursdays at 4.30 PM during the spring term: Prof. C. F. W. Illingworth, gastric function in relation to the treatment of peptic ulcer (Jan. 18); Mr. G. H. Macnab, actinomycosis (Jan. 25); Dr. R. Y. Keers, pulmonary tuberculosis (Feb. 8); Dr. A. E. Ritchie, physiology of peripheral nerve injury (Feb. 15); Dr. Robert Aitken, dermatitis (Feb. 22); and Dr. John Gillies, intravenous anæsthesia (March 8).

List of Medical Films

The medical committee of the Scientific Film Association have published their first handlist of films of medical interest. This gives a synopsis of 12 recent films and gives details of where to get them. Such lists, which are to be published at intervals, can be obtained from the hon. secretary. A series of film programmes are to be presented on the fourth Thursdays in February, March, April, and May at 5.30 PM and again at 8 PM. Season tickets admitting to all four shows from the hon. secretary of the medical committee, Dr. S. J. Reynolds, 14, Hopton Road, SW16.

CORRIGENDUM.—In Surgeon Lieut.-Commander Percival's article of Jan. 6, p. 16, second paragraph of Discussion, read: "... in the cases treated personally the stones have not exceeded 1 cm. in diameter."

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED DEC. 30

Notifications.—The following cases of infectious d were notified during the week; smallpox, 0; scarle fever, 1512; whooping-cough, 1179; diphtheria, 446 paratyphoid, 6; typhoid, 4; measles (excludin rubella), 8870; pneumonia (primary or influenzal), 81 puerperal pyrexia, 99; cerebrospinal fever, 38; poliomyelitis, 6; polio-encephalitis, 0; encephalitis lethar gica, 0; dysentery, 123; ophthalmia neonatorum, 52 No case of cholera, plague, or typhus fever was notified during the week.

[illegible]

Deaths.—In 126 great towns there were no deaths fro enteric fever, 14 (0) from measles, 1 (0) from scarle fever, 7 (1) from whooping-cough, 11 (1) from diphtheria 44 (1) from diarrhœa and enteritis under two years [illegible] 35 (1) from influenza. The figures in parentheses [illegible] those for London itself.

Liverpool reported 3 deaths from measles. There were 6 fatal cases of diarrhœa at Birmingham.

The number of stillbirths notified during the week wa 181 (corresponding to a rate of 33 per thousand tota births), including 15 in London.

Appointments

The Colonial Medical Service announces the following appointments:

FENDALL, N. R. E., MB LOND.: MO, Nigeria;
ELMES, B. G. T., MD EDIN., FRCPE: asst. director of laborator Services, Nigeria;
LESTER, H. M. O., OBE, PH D LOND., MRCS: ADMS, Nigeria.
LOCKHART, F. R., MB MANC.: DDMS, Kenya.
SNEATH, P. A. T., MD TORONTO: DDMS, Tanganyika.
YOUNG, S. M., MB MELB.: MO, Sierra Leone.

Births, Marriages, and Deaths

BIRTHS

BOLTON.—On Dec. 28, at Belfast, the wife of Dr. Sloan Bolton, o Portrush—a son.

BONEY.—On Dec. 28, to Mrs. Hilary Boney (née Long), FRCS, wi of Lieut.-Colonel Knowles Boney, MRCP, RAMC—a son.

BROCKLEBANK.—On Jan. 5, at Salisbury, the wife of Major J. Brocklebank, RAMC—a son.

EDKINS.—On Dec. 30, in London, the wife of Dr. J. R. P. Edkins—a son.

FRAZER.—On Jan. 1, in London, the wife of Prof. A. C. Frazer, MB—a son.

PENN.—On Jan. 2, in London, the wife of Surgeon Lieut.-Commander E. A. Penn, DSC, RN—a son.

PRICE.—On Dec. 28, at Newcastle-on-Tyne, the wife of Captai G. C. Price, RAMC—a son.

WALTERS.—On Dec. 25, at Elstree, the wife of Captain C. M. Walters, RAMC—a son.

MARRIAGES

GOWAR—ROGERS.—On Dec. 8, in Colombo, Frederick John Sam brook Gowar, FRCS, surgeon lieut.-commander RNVR, t Dorothy Mary Rogers, QARNNS (R).

LEAHY—LUMBY.—On Dec. 30, at Bath, Patrick Leahy, MB, t Rosemary Lumby.

SCOTT—HUDSON.—On Dec. 28, at Gloucester, Ronald Lesl [illegible] Gwendoline Mary Hudso

V[illegible] Heaton, Bradford, Geoffr [illegible] to Mary Ruth Barker.

DEATHS

CHARTRES.—On Jan. 5, at Southbourne, Edward Acheson Chartre FRCSI, lieut.-colonel RAMC retd.

DACRE.—On Dec. 30, John Dacre, MRCS, of Bristol, aged 83.

DORMAN.—On Dec. 30, at Kinsale, co. Cork, John Cotter Dorma CMG, MB DUB [illegible] MC retd, aged 92.

GRIFFITHS.—On [illegible] Joseph Griffiths, CMG MD EDIN., FR [illegible]

HARTLEY.—On Jan. 2, at Bournemouth, John Hartley, MB MAN

HORSBURGH.—On Jan. 3, at Ryde, Edward Leslie Horsburg MD LOND.

MACASKIE.—On Jan. 3, at Seahouses, Northumberland, Jam Griffiths Macaskie, LRCP, aged 89.

NOLAN.—On Dec. 27, at Newcastle, co. Down, Michael Jam Nolan, LRCPI, formerly superintendent, Down Mental Hospita JP.

O'MULLANE.—On Jan. 2, in London, Jerome John O'Mullan BA, MB, aged 52.

OWENS.—On Jan. 3, at Hersham, Surrey, Terence Francis Owens LRCPE, lieut.-colonel IMS retd., aged 66.

RIDDICK.—On Dec. 20, George Bushman Riddick, MRCS, lieut colonel RAMC retd, aged 73.

SAYER.—On Dec. 31, in London, Thomas Sayer, MD BRUX., MRCS aged 90.

WYNTER.—On Jan. 4, at Newbury, Berks, Walter Essex W MD LOND., FRCP, FRCS, aged 84.

The fact that goods made of raw [illegible]
to war conditions are advertised [illegible]
as an indication that they are [illegible]

MANAGEMENT OF HOSPITALS IN PEACE AND WAR*

SOMERVILLE HASTINGS, M.S. LOND., F.R.C.S.
CHAIRMAN OF THE LONDON COUNTY COUNCIL

I DESIRE to bring before you some observations on the administration of hospitals in peace and war. I need hardly remind you that I shall be speaking only for myself and not for any organisation with which I happen to be associated. Moreover, I am not proposing that all these suggestions are immediately practicable. They are, I believe, ideals to be aimed at, rather than proposals to be carried out everywhere at once.

THE GENERAL FRAMEWORK

I want to speak of hospitals as hospitals—that is, [illegible] am not proposing to [illegible] and built, or whether [illegible] ntary [illegible]

Nevertheless, the time has long passed when a hospital can be looked upon as an isolated unit, for no single hospital can economically provide for every type of patient who may require treatment. It is generally agreed, I think, that the best medical and surgical work is usually carried [illegible] hospital. Some would [illegible] such a hospital there [illegible] disease and tuberculosis, though I do not regard this myself as desirable. Neither do I feel that declared mental disease is best treated in connexion with a [illegible] ne of a group of two [illegible] wards or a separate [illegible] ute cases of mental diseases, as well as for the treatment of those not requiring certification, because in both there is often some physical illness [illegible] me time. This also has [illegible] psychiatric advice [illegible] rds who needs it. A good many cases of chronic illness, after thorough investigation in a general hospital, can be usefully transferred to hospitals where they can stay [illegible] nstitutions for younger patients, such as those [illegible] nic heart trouble or requiring rehabilitation [illegible] are best situated in the country; but old [illegible] no are not likely to recover, will be much [illegible] hospitals near their homes.

With the exception therefore of fevers, tuberculosis, declared mental disease, and some chronic cases, most patients needing hospital care are best dealt with within the wards of a large general hospital. For every unit of population of about 100,000 one such hospital of approximately 800 beds will be necessary. There is therefore, in my view, no place in the ideal system for the small cottage hospital, for the patients of such hospitals and their friends are certain to urge upon their docto [illegible] neith [illegible] educa [illegible] secur [illegible] rge [illegible] there, in my view, any place for what are generally [illegible] scribed as special hospitals; for you cannot cut the [illegible] ody up into little bits and treat each part separately.

It is not suggested, however, that every general [illegible] ospital should have special departments for the in- [illegible] atient treatment of every disease. There should be [illegible] edical [illegible] perhaps maternity [illegible] ards [illegible] ialties such as eyes, [illegible] ans, [illegible] should be grouped [illegible] d wards provided for such cases in one of a group of [illegible] ree or four. For specialties less often in demand, [illegible] ch as neurosurgery, chest surgery, thyroid surgery, [illegible] lastic surgery, and radiotherapy, a single department [illegible] r a group of eight or ten hospitals may be sufficient. [illegible] is of course assumed that officers in charge of a special [illegible] e at any hospital [illegible] ment of ordinary [illegible] hospital. [illegible], forming as they [illegible] wever to diseases of every kind and of every part of the body. There should be a pædiatrician attached to every maternity department. In addition it may very often be advantageous to have children's wards in one hospital of a group of three or four, when geographical conditions make this possible. Probably, however, the best arrangement of all is a hospital for children only, with its special departments for diseases of different regions, and a hospital school attached to it for long-stay cases in the country.

If the foregoing principles are accepted, even in general terms, it will be agreed that what is necessary is not a number of independent hospitals but a hospital system such as, for instance, that of the joint authority contemplated by the Government's white-paper on the health services. Such a body will have many and important functions. It will have to determine the conditions of service of the staff of all its hospitals, and costing arrangements, as well as the type of case to be admitted to each hospital, and this last may have to be altered at short notice in case of epidemic or emergency.

This then is the general framework into which all hospitals will have to fit. We can now pass to the more detailed examination of each individual hospital.

MANAGEMENT COMMITTEES

Every hospital should have its own committee of management. In the past this committee has been in complete control in the case of the voluntary hospitals, each of which has usually acted as an isolated unit. [illegible] place for a committee of management of each individual hospital? Would it not be better to group hospitals for this purpose or abolish [illegible] One obvious advantage fro [illegible] hospital staff would be the [illegible] of authority—there would [illegible] satisfy instead of two. Nevertheless in my opinion every hospital ought to have its own committee of manage- [illegible] system has been that through committees of all sorts, and other means, people of a district have been induced to take an interest in their local hospital and feel that it is their own. Even if in the future hospitals should be mainly or entirely supported by public funds, I hope these committees will continue and be extended to all hospitals. It is good for a hospital to be in intimate touch with the public that uses it. It is good for the staff to realise that their labours are known and appreciated. However complete the public provisions may appear to be, there will always be funds to be provided, personal services rendered, and experiments in social service carried out, by voluntary effort. In addition to committees of management, most hospitals will therefore benefit by samaritan, aftercare, entertainment, library, and other committees. To the committee of management should be allocated the appointment and discipline of the junior staff, the carrying out of cleaning and minor repairs up to an agreed sum, and other matters. Its main duty will be, however, to make recommendations to the central committee which will have to consider these not only as they affect the particular hospital but also the service as a whole.

STAFF COMMITTEES

To what extent should the staff of a hospital be in a position to influence its administration? I am of opinion that every member of the staff—medical, nursing, and lay—should not only realise the importance of the work he or she is doing, but should also feel assured that any suggestions he may desire to make for the [illegible] efficient running of the hospital will receive appr [illegible] consideration. It must be made clear from the [illegible] that if staff committees [illegible] rates of pay, and conditions of service mus [illegible] side their terms of reference, being de [illegible] committees, trade-unions, or similar [illegible]

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* Lecture delivered in London on Oct. 13, 1944, under the Chadwick Trust.

The medical superintendent, where one exists, and all members of the senior and intermediate medical staff, should be members of the medical staff committee. The junior staff should also appoint representatives. The committee should elect its own chairman. It has been suggested that if there is a medical superintendent he should ipso facto be chairman of the committee. This appears to me undesirable and liable to limit freedom of discussion and recommendation. The terms of reference of the committee should be wide and should include such matters as accommodation, staffing, teaching, research, and equipment. Certain of the recommendations of the medical staff committee will be within the jurisdiction of the hospital superintendent, and if he is in agreement they can be carried out at once. Otherwise they will come before the hospital committee with other matters within the terms of reference of that committee. Other recommendations will go to the central coördinating body either direct or (perhaps better) through a central medical staff advisory committee formed of representatives of the medical staff committees of all the hospitals in the unit.

The nursing staff committee should have a similar constitution. It should consist of representatives elected by student nurses of the first, second, third, and fourth year, of staff nurses, ward, and administrative sisters, and also assistant and male nurses, if employed. Each of these categories should meet independently to discuss problems and elect representatives. It is probably best that in most hospitals the matron should not be a member of this committee, but recommendations made to the hospital management committee would be seen by the matron and she would no doubt in many cases report to that committee that she had already taken the necessary action. A central nurses' advisory committee formed of representatives of the local committees to deal with questions of general application and to report direct to the central coördinating body might also be desirable.

In at least one hospital at the commencement of the present war the medical superintendent called together representatives of every grade of staff and asked for suggestions for the running of the hospital during the difficult times ahead, and this committee has been meeting at intervals ever since. Joint production and efficiency committees have proved of value in industry and ought to be tried out in hospitals. They would have nothing to do with staff matters, but would make it possible for every employee of the hospital to make suggestions for its more efficient running. These staff advisory committees should be formed of representatives of every grade of staff and make recommendations to the hospital committee.

CLINICAL UNITS

Every general hospital will require at least three departments—medical, surgical, and gynæcological. The medical will usually be the largest, for it will include the chronic sick. Each department, general or special, should be staffed on the "clinical unit" system—that is to say, there should be a physician or surgeon of consultant status, who would be in complete clinical charge, with an assistant, one or two registrars, and a variable number of junior and senior house-officers. In the case of the special departments the clinical unit would be centred in one general hospital, but the doctor in charge or his assistant would attend at other hospitals as required, and also, it is hoped, at health centres and to see patients in their own homes.

THE SUPERINTENDENT—MEDICAL OR LAY ?

Perhaps it may be useful at this stage to consider the much discussed question of whether the superintendent or director of a hospital should be a doctor or a layman. At Guy's Hospital there is a medical superintendent and a lay clerk to the governors, each responsible for matters within his own sphere, and the system apparently works well. But in most hospitals it is found to be more convenient to have one person responsible for the general administration of the whole institution, leaving the clinical care of patients to the doctors in charge. Should this superintendent be a doctor or a trained layman ?

In the case of hospitals for infectious and mental diseases and tuberculosis the decision should be easy. The cases are all of one type, and, the sphere being limited, it is possible for a single individual to become an expert in all maladies dealt with in that particular hospital. The chief clinical officer will therefore naturally become the head of the hospital. In the case of infectious disease, especially, he may well also become the clinical consultant of his district.

In the past, the officer in charge of a municipal hospital has been a doctor, but in a voluntary hospital it is usual to appoint as secretary-superintendent, a layman. It is clear that no single doctor can have sufficient knowledge and experience to deserve a place as the head of each of the clinical units into which a hospital is divided, and accordingly it has been suggested that one of the heads of the clinical units should act as medical superintendent and that the individual selected should be changed every few years. This suggestion has in my opinion nothing to recommend it. A good clinician is but rarely a good administrator ; nor would one expect the head of a clinical unit who was really keen on his work to be willing to leave it even for a few hours daily to undertake the administrative control of a large hospital. Nevertheless, there is much to be said for the superintendent of a hospital being a qualified doctor. A man with medical experience is in a much better position to deal with complaints of patients and their friends, as well as to solve the administrative problems which a committee may present to him. In matters of discipline and the allocation of duties among the medical staff the medical administrator has a distinct advantage. Moreover, it is clear that in the future hospitals will function as a system and not as a series of individual units. This must imply not only some central control, but also at times rapid change of use of wards or even whole hospitals. A doctor will be in the best position to carry out instructions of this nature.

The work of a medical superintendent is both important and absorbing, but if such an individual is to maintain his keenness and breadth of outlook it is probably desirable that a portion of his time should be devoted to other duties, as for instance the medical care of the resident staff or some branch of medicine or surgery in which he is interested. I have seen the work of medical superintendents who are also pseudo-specialists, and it has not in every case been such as to enha[illegible] due to them from those under their [illegible] charge. A better proposal is as follows. It seems pretty clear that some form of National Health Service is on the way. If, as has been suggested, the country is divided up into units of 100,000 people with wherever possible a large general hospital in each, it might be desirable for the medical superintendent of the hospital to act administratively as supervisor also of the consultant services of this unit and also of the health centres or other general-practitioner services.

When a hospital stands as an isolated unit its superintendent, be he medical or lay, will have to advise the committee of management, which is in complete control, and his responsibility will be great. When, however, a hospital is one of a group or system, all major issues will be decided by the central coördinating body, and the superintendent will be able to consult the permanent staff of this body in case of doubt. In either case the superintendent should have an intimate knowledge of the law as it affects hospitals, accidents, and employees, as well as mental and infectious disease and public health generally. Although there will usually be an engineer to advise on problems of maintenance of buildings, heating, lighting, and so on, and a steward to deal with accountancy and supplies, the superintendent should have considerable knowledge of these also. It is desirable therefore that all those aspiring to an administrative staff appointment or to become the superintendent of a hospital should be encouraged to take a diploma in hospital administration. It may also be said generally that an officer who has had some experience of central administrative staff work will make a better hospital superintendent.

FULL-TIME OR PART-TIME STAFF ?

In my opinion the best results are likely to be obtained if the medical staff of a hospital are full-time officers. I am well aware that the consultant, who visits patients of the well-to-do in their homes, is supposed to d from this a breadth of outlook unobtainable by any other means. I unhesitatingly agree that for a full understanding of its natural history disease must be studied as it occurs in the homes and work-places of the people. But surely the consultant who, as proposed in the white-paper, visits, when necessary, any person of whatever class, however lowly, in his home will have a better knowledge of ætiology than one who, as at present, sees no more than a favoured few. By visiting patients in their homes, by outpatient as well as inpatient work, by constant contact with colleagues in every branch of practice and perhaps most of all by research work, the full-time hospital doctor should find no difficulty in maintaining interest and keeping himself up to date. Visits to other clinics in this country and abroad should be encouraged, as well as attendance at national and international conferences.

The hospital doctor, whether a full-time officer or not, should live within a short distance of the hospital in which his patients are warded. The treatment of disease, both medical and surgical, is a continuous process in which the highest skill available may be required at any time. There can of course be no objection to the consultant or specialist travelling some distance from his home to give an opinion, but the surgeon who attends a cottage or other hospital at weekly or forthightly intervals and undertakes routine operative treatment at these visits is in my opinion asking for trouble.

But while all doctors should live near the hospital in which their patients are housed, comparatively few ought of necessity to live in. In the past, I think, many hospitals, especially municipal, have asked too much of their medical staff. Of course there must always be some doctors on the premises to deal with such sudden emergencies as severe bleeding or suffocation. There must also be highly skilled personnel on call. Fortunately, however, there are very few cases in which serious harm will result from waiting the 10 or 15 minutes that it should take such assistance to reach the hospital. The doctor who, living near the hospital, spends most of his leisure in his home, will usually be of greater value than the resident who spends all his available free time in visiting his wife or friends some distance away.

PROFESSIONAL AND POLITICAL FREEDOM

A great deal has been written regarding the need for
political freedom
on. If, as seems
ll become engaged
in the public service either whole or part time, to grant
any thi
And th
health
to spec
have t
teacher employed in the State schools has been allowed to become a member either of any local authority or of any but the one that employs him. To apply any such restriction under the set-up envisaged by the white-paper with a joint hospital authority covering a large area,
[illegible] health workers from

WORK AND PROMOTION

A few other points in connexion with medical staffing may be mentioned. It takes many years of training and experience, gained unfortunately by failure as well as
succe [illegible] Surely everything
sho
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an
when this can be done both more quickly and efficiently by a shorthand-typist, is wasteful in the extreme. The provision of such assistance will be found to increase the output of work of many hospital doctors considerably.

One of the weaknesses of the voluntary hospital system is fixity of staff, many of whom, like myself, have remained attached to the same hospital continuously since their student days. It is rarely that a doctor under 10 should remain for more than 5 years at one hospital, and a medical superintendent, whatever his age, ought to change his hospital fairly frequently. Some little experience has convinced me that, with very few exceptions, a medical superintendent has made his greatest contribution to any one hospital within 10 years of his appointment to it.

And now a word about promotion. It is human nature to prefer the known to the unknown, and the committee of management of a municipal no less than of a voluntary hospital generally exhibits a strong tendency to appoint the man or woman on the spot rather than a stronger candidate from outside. The only way to avoid this danger is by having a large unit of hospital administration. Junior or house officers might well be appointed
by the committee
sultation with the
the clinical unit co
be elected by the
mittee appointed b
final selection should be made by this body, the short-listing, if not indeed the placing of those selected in order of merit, should be carried out by a body of experts. For clinical appointments the short-listing committee should consist of the heads of clinical units in the branch of practice concerned, together with representatives of the central staff: for administrative appointments there should be representatives of the medical superintendents and central staff. It is to be hoped that before long all hospitals of any size will take their place in a

which may involve teaching.

STUDENTS

At this point I would like to interpolate a few words about the value of students to a hospital. All who have engaged in clinical teaching will realise how useful to the teacher is the impact of young, vigorous, and critical minds. But that is by no means all. Students bring a breath of fresh air from the outside world which is felt by all—nurses, patients, everyone. Where students are widely distributed, as they must be for efficient clinical instruction, few patients will object to their presence for they realise that fresh facts are often brought to light by the discussion of their cases. The
presence of studen or post-
graduate, adds to th improves
both the status and

NURSES

I shall not venture more than a few general observations on the administration and conditions of service of the hospital nursing staff. The student nurse must be regarded much more as a student and much less as a
source of resent. With this in
view she to gain experience in
the nursi types of patient as
may be required, even if this necessitates a change of hospital. She should work a 48-hour week or less, and these hours should include not only all lectures and classes but also an hour a day spent compulsorily in library or classroom for study or the writing up of lecture notes. The only satisfactory way to study a clinical profession is to read up details of the work on which one is actually engaged, and every student nurse must have ample opportunity for doing this.

Unless the student nurse's home is reasonably near the hospital she should reside within its curtilage during
her st
preside
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and we
be granted as is consistent with the important du
that the student nurse has to perform, and whil
matron of the hospital should maintain strict dis
as long as the nurse is on duty or in the classro
jurisdiction should abruptly cease direct
leaves the hospital.

There is a good deal to be said for m
in hospital of all State-registered

optional. Given a comfortable bed-sitting-room and facilities for entertaining visitors there are many nurses who prefer to live in a hostel with friends and colleagues; and especially is this the case during difficult times like the present. On the other hand there are some who feel that the complete freedom that they desire is impossible under these conditions. There is no doubt that the right thing is to leave the matter to be determined by the individual nurse or sister, but this uncertainty of demand gives rise to serious difficulties on the part of those responsible for the provision of hostel accommodation. The nurse who marries and sets up a home will of course live out. She should be required to give up nursing only temporarily before and after childbirth.

PRIVACY FOR PATIENTS

People vary greatly as regards their reactions to their fellow beings. Some, perhaps because they have lived under more or less overcrowded conditions all their lives, cannot bear to be left alone even in sickness. Others, when ill, desire solitude beyond all else. It would not be very expensive to change all hospital wards into curtained cubicles, and I am hopeful that this may be achieved within a few years of the end of the war. The provision of curtains, together with the occasional change of the position of patients in the wards, should go far to satisfy the wishes of most. But in addition, for those who are acutely ill or noisy or in any way likely to disturb others, a supply of single-bedded side wards is essential. Surgical cases are especially liable to be restless during the first night after operation. It is useful therefore to have a section of a surgical ward partitioned off by a glass screen. To this section new cases are admitted, and in it they remain until the day after operation, when they should be transferred to the other part of the ward.

Should wards or rooms for paying patients be provided in hospitals and should payment be for privacy and extra amenities only? Or should there be in addition fees to the doctors for services rendered? I would answer both questions in the negative. However hospitals may be paid for in the future, I feel that there must be no demand for any immediate financial contribution which could act as a deterrent and tend to prevent anyone from taking advantage of the hospital services that he needs. But if hospital treatment is free to all, no-one will be willing to pay for it unless he expects to receive superior amenities or greater care in treatment, as in practice he certainly will. This must necessarily imply that the services provided for those who do not pay this extra sum are not of the best. It is infinitely better, I think, to try to raise the standard for all than to provide an improved service for a favoured few, selected solely because of their relative affluence. Small wards, curtained cubicles, and a sufficiency of side wards should be capable of giving privacy to all who desire or need it.

There is one relatively small matter in which both voluntary and municipal hospitals are too often sadly lacking. It is in provision for the comfort of those visiting seriously ill relatives. A room that can be warmed, with comfortable easy chairs and couches, should be provided and provision made for a simple meal at night if necessary. It is not likely that such amenities would be often abused.

WAR

Comparing the present with the last great war, there have been two definite improvements. First, the Emergency Medical Scheme, through which all hospitals of any size, both municipal and voluntary, have had to obey the instructions of the Ministry of Health, has brought some order into our chaotic hospital system. Secondly, Service cases have been admitted to the same hospital as civilians and treated by the civilian doctors in them to a much greater extent than in the last war. This classification of patients according to the nature of their affections rather than the type of clothing that they wear is certainly a step in the right direction. But it must go further and be extended to the wards of hospitals, for every type of disease requires its own special type of nursing and treatment. It is manifestly absurd to have in the same hospital different wards for civilians, sailors, soldiers, and airmen with a few cases of the several types of disease in each. It should be easy to so assimilate the regulations governing the feeding and behaviour of each of these classes that neither becomes adversely affected by the presence of the other. All cases of allied affection could then be treated in the same wards with consequent benefit to all concerned.

In conclusion, I wish to express my thanks to Sir [illegible] Daley, MOH for the County of London, for much [illegible] advice, both in the preparation of this lecture, and also during the 10 years of administrative experience that made it possible.

BACTERIOLYTIC ACTION OF PENICILLIN

E. W. TODD, MD CAMB., DPH *

Inoculation Department, St. Mary's Hospital, London;
Serum Institute, Wellcome Foundation

Fleming's first observation on penicillin was the lysis of colonies of *Staphylococcus aureus* on an agar plate at the circumference of a colony of *Penicillium notatum*. It was therefore the observation of bacteriolysis which led to the discovery of penicillin.

Many interesting facts in Fleming's original (1929) article on penicillin seem to have been overlooked, and not the least interesting is his observation that staphylococci in broth cultures containing penicillin multiply during the first few hours of incubation and that the organisms are killed and lysed after this initial period of multiplication. Rantz and Kirby (1944), using photoelectric turbidimetric methods, found that the action of penicillin on staphylococci in broth could be divided into several phases. At first the staphylococci multiplied in penicillin-broth at the same rate as in plain broth; then multiplication slowed down and ceased. Finally progressive bacteriolysis was observed. Himmelweit (1944) found that young broth cultures of staphylococci are lysed by penicillin much more quickly than older cultures.

METHODS

Cultures, opaque enough for bacteriolysis to be observed, were made in tryptic digest broth; the time of incubation varying from 1 to 5 hours according to the rate of growth of the organism. Turbidity standards were prepared by adding formalin in a dilution of 1 in 100 to varying quantities of the organisms in broth made up to a total volume of 1 c.cm. A suitable dilution of penicillin in a volume of 0·1 c.cm. was added to another portion of the same culture so that the final total volume was 1 c.cm. The tubes were then incubated in a water-bath at 37° C. Any increase or decrease in turbidity of cultures was noted at short intervals by comparison with the formolised standards. Young cultures which had been stored overnight at 0° C lysed as quickly as freshly prepared cultures, and this method was often adopted because it allowed more time during the day for observation of progressive bacteriolysis.

PNEUMOCOCCUS

A 3-hour culture of *Pneumococcus* type I was mixed with 1 unit of penicillin. The turbidity of the culture increased during the first hour of incubation, it then returned to its original level, and within 2 hours progressive lysis had commenced. After 4½ hours' incubation the culture was completely lysed and a loopful of the clear fluid developed one colony when spread on a blood-agar plate previously treated with penicillinase. A control plate of the culture without penicillin developed innumerable colonies.

The same experiment with *Pneumococcus* type II gave a similar result. The opacity at first increased, progressive lysis commenced in 1½ hours and was complete in 4½ hours. A penicillinase blood-agar plate was sown with a loopful of the lysed culture after 4½ hours' incubation and it remained sterile.

Pneumococcus type III lysed more slowly. Increa[illegible] turbidity persisted for 2 hours; lysis commenced in 3 hours and was complete in 6 hours.

Rapid lysis of pneumococci by penicillin is dependent on the age of the culture. A 16-hour culture of *Pneumococcus* type II was mixed with 1 unit of penicillin During the first 10 hours of incubation there was no increase or decrease of turbidity. After 24 hours a trace of lysis was observed and this was not increased after 48 hours' incubation. The lysis was however greater than that of a control culture without penicillin. In a parallel experiment, done at the same time with a 4½-hour culture of the same strain, lysis was complete within 4 hours.

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* Seconded for the duration of the war from the London County Council.

Active multiplication of organisms appears to favour rapid bacteriolysis by penicillin. This is again demonstrated in the following experiment. A 4½-hour culture of *Pneumococcus* type III was divided into two parts. One part was centrifuged down, washed once in saline and made up to its original volume with saline. When mixed with 1 unit of penicillin, as described in previous experiments, the broth culture at first increased in turbidity; lysis commenced in 6 hours and was complete in less than 20 hours. On the other hand, there was no multiplication in the saline suspension and the amount

TABLE I—EFFECT OF NORMAL RABBIT SERUM ON THE RATE OF GROWTH OF PNEUMOCOCCUS TYPE III AND ON THE RATE OF ITS LYSIS BY PENICILLIN

Incubation	0.8 c.cm. of culture + 0.1 c.cm. of saline		0.8 c.cm. of culture + 0.1 unit pen.		0.8 c.cm. of culture + 1 unit pen.	
	+0.1 c.cm. serum	+0.1 c.cm. saline	+0.1 c.cm. serum	+0.1 c.cm. saline	+0.1 c.cm. serum	+0.1 c.cm. saline
0	0	0	0	0	0	0
1	1	1	1	1	+	1
2	3	2	+	1	++	1
3	4	3	++	1	+++	1
4	4	3	+++	1	++++	0
5	4	3	+++	1	++++	0
6	4	3	++++	0	++++	+
7	4	3	++++	0	++++	+
8	4	3	++++	0	++++	++
24	4	2	++++	+++	++++	++++

= original turbidity. 1, 2, 3, 4 = degrees of increased turbidity.
+, ++ = partial lysis. +++ = almost complete lysis.
++++ = complete lysis
cteriostatic dose of penicillin for this culture, 0.016 unit per c.cm.

lysis after 20 hours was not much greater with peni-llin than in a control saline suspension.

Since lysis appears to depend on active multiplication the organisms an experiment was done to see whether ore rapid multiplication caused by the addition of ormal rabbit serum would also lead to more rapid sis. Table I shows the result of this experiment. he addition of serum to the culture greatly increased [illegible] tion and the rate of lysis [illegible] 1 unit of penicillin lysed too [illegible] increase in turbidity to be

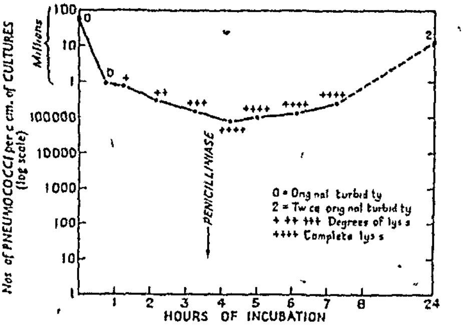


Fig 3—Pneumococcus type III. Effect of adding penicillinase to a culture almost completely lysed by penicillin

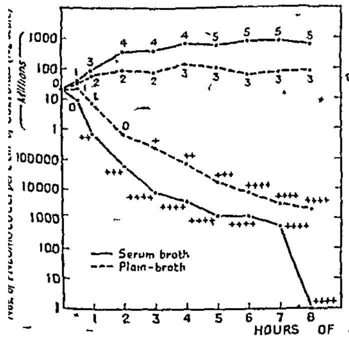
obser[illegible] with [illegible] In all [illegible] in turbidity preceded lysis.

In order to correlate the number of living pneumococci with the opacity of the cultures undergoing multi-[illegible]

omitted. Suitable dilutions of the cultures were plated in poured blood-agar at intervals for colony counts. Fig. 1 gives the result of this experiment. The curves represent the increase or decrease in pneumococcal population and the turbidity is recorded at each point on the curves. The serum-culture increased in 3 hours from 20 million to 430 million organisms per c.cm.; the serum-penicillin culture was completely lysed in 3 hours, as judged by the absence of any turbidity, and the count had fallen from 20 million to 9 thousand organisms per c.cm. On the other hand, in the cultures without any serum, both multiplication and lysis were relatively slow. In 3 hours the plain broth culture increased to 80 million organisms per c.cm. and with penicillin lysis was just beginning with a count of [illegible] thousand organisms per c.cm. After 24 hours' incubation the counts were as follows: (1) serum-broth 34 million per c.cm.; (2) plain broth 10 million per c.cm.; (3) plain penicillin-broth sterile; (4) serum-[illegible] broth sterile.

Fig. 2 gives the result of a similar experi[illegible] 0.5% of glucose was used to accelerate [illegible] of serum. Glucose caused a similar [illegible] pronounced acceleration of both [illegible] lysis.

It will be [illegible] 1 and 2 that the [illegible] turbidity [illegible] is imperfect. [illegible] in turbidity [illegible] a falling count [illegible]. It seems [illegible] multiplica-tion [illegible] may allow [illegible] at the same time [illegible] pen-[illegible] [illegible]



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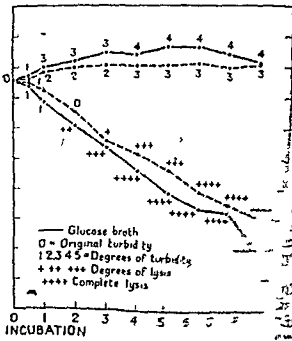

g 1—Pneumococcus type III. Curves showing from above downwards: (1) M[illegible] (2) Multiplication in plain broth. (3) Lysis in plain penicillin-broth. (4) Lysis in [illegible] Concentration of penicillin 1 unit per c.cm.

g 2—Pneumococcus type III. Curves showing from above downwards: (1) M[illegible] (2) Multiplication in plain broth. (3) Lysis in plain penicillin-broth. (4) L[illegible] Concentration of penicillin 1 unit per c.cm.

3½ hours, when the count had fallen from 54 million to about 100 thousand organisms per c.cm. and turbidity had almost disappeared. 3 units† of penicillinase were added to the culture. Thirty-five minutes later lysis was complete, as judged by turbidity, and the culture contained 80 thousand organisms per c.cm. A slow multiplication of pneumococci then began, and during the eighth hour, although no turbidity could be detected, the count had risen to 260 thousand organisms per c.cm., After overnight incubation turbidity had risen to twice the original level with a count of only 12 million pneumococci per c.cm., presumably owing to the presence of dead and living pneumococci which had failed to lyse after the penicillin was neutralised. The continued presence of penicillin is therefore necessary for the completion of lysis and sterilisation.

STREPTOCOCCUS VIRIDANS

A young actively growing culture of *Strep. viridans* which had been incubated for 3 hours was mixed with 1 unit of penicillin in a total volume of 1 c.cm. Turbidity increased during the first hour; progressive lysis then commenced and was complete in 3 hours.

A second strain of *Strep. viridans* which was more resistant to lysis by penicillin was treated in the same way with 1 unit of penicillin; an additional tube of the culture was tested containing 1 unit of penicillin and 10% normal rabbit serum to accelerate lysis. The culture without serum showed increased turbidity during the first 3 hours and after 24 hours it had lysed to about half the original turbidity. The serum-culture increased in turbidity for 1½ hours; lysis then commenced and was complete in 24 hours.

A third strain of *Strep. viridans* which was still more resistant to lysis by penicillin was treated in the same way. The culture without serum showed increased turbidity for 7 hours and after 24 hours it had returned to its original turbidity. The serum-culture at first increased in turbidity; lysis commenced after 3½ hours and the culture was about half lysed after 24 hours' incubation.

HÆMOLYTIC STREPTOCOCCI

Lysis of hæmolytic streptococci by penicillin was not obtained with any of the numerous strains tested unless serum was added to the actively growing young cultures at the same time as the penicillin. Three-hour cultures of three different strains of group A hæmolytic streptococci were mixed with 100, 10, 1, and 0·1 units of penicillin and 10% normal rabbit serum. After 19 hours' incubation one strain showed definite partial lysis and one showed doubtful lysis. After incubation for another 24 hours all the strains showed definite partial lysis. There appeared to be little difference in the degrees of lysis caused by the different doses of penicillin.

Hæmolytic streptococci of groups C (human origin) and G also underwent partial slow lysis by penicillin in serum-broth. One of the group C strains was completely lysed on the sixth day.

STAPHYLOCOCCUS

Young cultures of staphylococci in the stage of active multiplication are rapidly lysed by penicillin. With older cultures, which have been incubated for 16 or 24 hours before adding the penicillin, lysis is much slower and may not be complete until incubation has been continued for 3 or 4 days.

As shown by Fleming (1929), staphylococci multiply in the presence of penicillin before the commencement of lysis. As in the case of pneumococci rapid initial multiplication is followed by an increased rate of lysis. This is demonstrated in fig. 4, which records the turbidity and lysis of a 3-hour culture of staphylococci treated with different doses of penicillin. The bacteriostatic dose of penicillin for this strain is 0·06 unit per c.cm. When 0·025 unit of penicillin was added to the culture, in a total volume of 1 c.cm., rapid multiplication was followed by rapid lysis, which did not however proceed to completion and was followed by a second period of multiplication. With 0·16 unit of penicillin a short period of rapid multiplication was followed by the most rapid lysis, which was complete in 3 hours. With a ten-fold increase in the dose of penicillin to 1·6 units per c.cm. multiplication was delayed and much less pronounced, while the subsequent lysis was not complete until the culture had been incubated for 6 hours. This seems to show that staphylococci conform to the general rule that the rate of lysis by penicillin depends on the actual or potential rate of multiplication of the organisms.

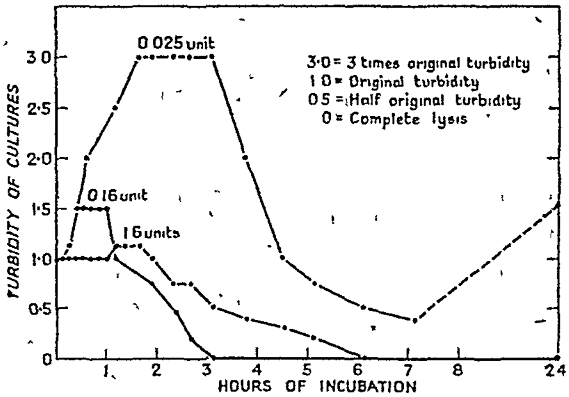

Fig. 4—Staphylococcus, strain H. Increase of turbidity and lysis with various concentrations of penicillin. Bacteriostatic dose of penicillin for this strain = 0 06 unit per c.cm.

This is demonstrated in table II, which shows the times of lysis of young cultures of two strains c[illegible] The strain H did not increase in turbid[illegible] or 1 units of penicillin, and with all [illegible] occurred at the same rate. With 0·1 [illegible]

TABLE II—MULTIPLICATION AND LYSIS OF TWO STRAINS OF STAPHYLOCOCCUS WITH VARIOUS DOSES C[illegible]

Hours of incubation	Strain H					Strain K 1				
	Units of penicillin per c.cm.					Units of penicillin per c.cm.				
	100	10	1·0	0·1	0·01	100	10	1·0	0·1	0·01
0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	1	1	0	1	1	1	1
2	0	0	0	+	1	1	1	1	1	1
3	0	0	0	++	1	1	1	0	1	1
4	+	+	+	+++	1	±	+	+	0	1
5	++	++	++	++++	1	++	++	+++	++	1
6	++	++	++	++++	1	++++	++++	++++	++++	1
7	++	++	++	++++	1	++++	++++	++++	++++	1
8	++	++	++	++++	1	++++	++++	++++	++++	1
24	++++	++++	++++	++++	1	++++	++++	++++	++++	1

0 = original turbidity. 1 = increased turbidity. ±, +, ++ = degrees of lysis. +++ = almost complete lysis. ++++ = complete lysis. Bacteriostatic doses of penicillin for strain H, 0 06 unit per c.cm.; for strain K 1, 0·06 unit per c.cm.

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† One unit of [illegible] antity required to neutralise one unit [illegible] ated for bacteriostasis of staphyloc[illegible] of dilutions.

TABLE III

MULTIPLICATION AND LYSIS OF STAPHYLOCOCCUS STRAIN H WITH VARIOUS DOSES OF PENICILLIN IN BROTH AND IN SALINE

Hours of incubation	Washed cocci in broth						Washed cocci in saline						
	Units of penicillin per c.cm.						Units of penicillin per c.cm.						
	1·0	0·5	0·2	0·1	0·05	0·02	1·0	0·5	0·2	0·1	0·05	0·02	Nil
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	2	3	4	5	6	7	0	0	0	0	0	0	0
2	1	1	1	1	3	4	0	0	0	0	0	0	0
3	1	1	0	+	2	3	0	0	0	0	0	0	0
4	0	0	++	++++	0	3	0	0	0	0	0	0	0
5	0	+	++++	++++	+	2	0	0	0	0	0	0	0
6	+	++	++++	++++	++	2	0	0	0	0	0	0	0
7	+++	+++	++++	++++	+++	2	0	0	0	0	0	0	0
24	++++	++++	++++	++++	1	1	++	++	++	++	++	++	++

0 = original turbidity. 1, 2, 3 &c. = degrees of increased turbidity. +, ++, +++ = degrees of lysis. ++++ = complete lysis.

initial multiplication was followed by more rapid lysis. On the other hand, strain K 1 multiplied in all the dilutions of penicillin and there was comparatively little difference in the rate of lysis by the various doses [illegible] e, [illegible] lase-negative strains tested, three lysed [illegible] with small doses and three with large doses, there being one coagulase-negative strain in each group.

Table III shows the effect of various doses of penicillin on a 3-hour culture of staphylococcus H which was divided into two parts, washed once in saline and resuspended (*a*) in broth, (*b*) in saline. In this experiment multiplication in broth occurred with all the doses of penicillin including 1 unit. The most rapid multiplication and lysis were observed in the tube containing the smallest dose of penicillin, which was greater than the [illegible] the cocci were suspended in [illegible] plication and no lysis apart [illegible] occurs when young staphylo[illegible] e. [illegible] multiplication favours rapid lysis by penicillin, and the following experiment shows that staphylococci in the resting state, can survive in large doses of penicillin.

A 24-hour culture of the strain H in 8–10 c.cm. of broth was mixed with 100 units of penicillin in 1 c.cm. of saline. After 6 da[illegible] subcultured into fresh [illegible] again treated with 100 [illegible] was repeated five times [illegible] the treated staphylococci were no more resistant to bacteriostasis or lysis by penicillin than the original strain. It was found that after 8 days' incubation the culture still contained about 6 units per c.cm. of penicillin. The resting organisms had therefore been exposed to penicillin for 6 days on five separate occasions without sterilisation.

In a similar experiment with 1000 units of penicillin and a 24-hour culture of staphylococcus strain A it was found that the resting staphylococci survived and grew out when subcultured into broth containing penicillinase. Old cultures of pneumococci which are not actively dividing also survive in large doses of penicillin.

CLOSTRIDIUM WELCHII

Two strains of *Clostridium welchii*, S 107 and A 118, were tested for lysis by penicillin. Overnight cultures growing actively in Robertson's meat medium were subcultured into digest broth without meat, which was boiled and cooled to 37° C immediately before sowing. After 1½ hours' incubation the cultures, which were then actively multiplying and forming gas, were mixed with 100, 10, and 1 units of penicillin as previously described for aerobic organisms. Table IV shows that initial multiplication was followed by lysis which was almost complete with the larger doses of penicillin after 22 hours. A considerable increase in the rate of multiplication occurred when 0·5% glucose or 10% normal serum was added to the cultures, and under these conditions 10 units of penicillin caused complete lysis in less than 17 hours.

When sodium thioglycolate was used to produce anaerobiosis, and when the tubes were sealed with soft paraffin to exclude air, an increased rate of multiplication was accompanied by much more rapid lysis. With 10 units of penicillin per c.cm. a 2-hour culture of strain A 118 was completely lysed in 1 hour when 10% of serum and 1% of glucose were added to the culture; with 10% serum alone lysis was complete in 1½ hours and with 1% glucose alone in 2 hours. Similarly with 1 unit of penicillin per c.cm. the serum-glucose culture was completely lysed in 3 hours; the serum-culture was almost completely lysed in 6 hours and the glucose-culture was half lysed in 6 hours. Without any penicillin the upward displacement of soft paraffin seals [illegible] rs was as follows: (1) serum- [illegible] (2) serum-culture 6 mm.; [illegible] The rate of lysis therefore [illegible] of gas formation.

TABLE IV—MULTIPLICATION AND LYSIS OF TWO STRAINS OF *Cl. welchii* WITH VARIOUS DOSES OF PENICILLIN

Hours of incubation	Strain S 107				Strain A 118			
	Units of penicillin per c.cm.				Units of penicillin per c.cm.			
	100	10	1	Nil	100	10	1	Nil
0	0	0	0	0	0	0	0	0
1	1	1	2	3	1	1	2	2
2	1	1	3	4	1	1	2	3
3	+	0	2	4	+	0	2	4
4	++	+	2	4	+	+	2	4
5	+++	+	2	4	+	+	2	4
22	+++	+++	1	4	+++	+++	++	4

0 = original turbidity. 1, 2, 3 &c. = degrees of increased turbidity. +, ++ = degrees of lysis. +++ = almost complete lysis.

DISCUSSION

All the penicillin-sensitive organisms tested were susceptible to bacteriolysis by penicillin. On the other hand penicillin-insensitive organisms such as *Bacillus coli* and *Ps. pyocyanea* were not lysed by penicillin. The question arises whether the bacteriostatic action of penicillin is distinct and separate from the bacteriolytic action or [illegible] manifestations of one and [illegible] can be no doubt that penicillin is capable of killing micro-organisms without lysis, and it seems probable that multiplication, death, and lysis may all occur independently at the same time in a culture containing penicillin. This is shown in fig. 2 where, during the first 2 hours of incubation, turbidity increased with a diminishing colony count, presumably owing to rapid multiplication accompanied by a still more rapid death-rate but without correspondingly rapid lysis. After this initial period progressive lysis and a steadily falling colony count proceeded to complete lysis and complete sterilisation.

When the potential rate of multiplication is increased by the addition of serum, as shown in table I and fig. 1, bacteriolysis begins within an hour without any preliminary increase of turbidity or other evidence of multiplication. It is however possible that in this case multiplication is not detectable because both the death-rate and the rate of lysis exceed the rate of multiplication.

Whether this is the correct explanation or not it seems to be a general rule that the rate of bacteriolysis by penicillin depends on the actual or potential rate of multiplication of the organisms. Hobby, Meyer, and Chaffee (1942) showed that multiplication of organisms is necessary for the action of penicillin. Bigger (1944) found that staphylococci which are not actively dividing survive in penicillin while the actively multiplying organisms are killed. This is confirmed by experiments quoted in this paper. It would appear that bacteriostasis, bactericidal action, and bacteriolysis may be different stages of a single process proceeding in that order. Undoubtedly bacteriolysis is one method by which penicillin can sterilise a culture, but it is not necessarily the only method. There is at present no evidence whether one or more factors are involved in the bacteriostatic, bactericidal, and bacteriolytic effects of penicillin since the method of its action is unknown.

It is interesting to note (see table III and fig. 4) that a dose of penicillin which is considerably smaller than the amount required to produce bacteriostasis in the usual laboratory tests has a definite bacteriolytic action on staphylococci. This sequence of multiplication, lysis, and renewed multiplication in very dilute penicillin can also be demonstrated with pneumococci. If the same thing occurs in the human body, where unrestricted multiplication is prevented, bacteriolysis will continue after the blood level of penicillin has fallen below the amount required to produce bacteriostasis in ordinary laboratory tests.

It may be that the real reason why penicillin is so effective is the fact that young cultures in the stage of active multiplication are more susceptible to the bacteriolytic action of penicillin than older cultures. Todd (1927) and Hare (1931) showed that old cultures are killed or phagocyted by normal human blood, whereas young cultures are highly resistant to these normal mechanisms of blood clearance.

It is therefore fortunate that the organisms which are in such a state that they could readily invade the human body are in just the state when they are most susceptible to the bacteriolytic action of penicillin.

SUMMARY

Bacteriolysis by penicillin is dependent on the phase of growth of the organisms.

Bacteriolysis by penicillin has been observed with all the penicillin-sensitive organisms tested—*Pneumococcus* types I, II and III, *Strep. viridans*, hæmolytic streptococcus groups A, C, and G, staphylococcus, and *Cl. welchii*.

The most rapid lysis occurs with organisms at the maximal rate of multiplication.

This may be the real reason why penicillin is so effective in treatment.

I wish to thank Sir Alexander Fleming for his interest and assistance.

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PNEUMOCOCCAL LOBAR PNEUMONIA TREATED WITH SULPHAMEZATHINE

A FURTHER STUDY

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THIS paper gives some further account of an investigation of which a first report was published 2 years ago (Macartney et al. 1942). An additional series of 287 cases of pneumococcal lobar pneumonia have been treated with 'Sulphamezathine' (formerly known as 'Sulphamethazine'), a heterocyclic sulphonamide compound [illegible] markable alike for its [illegible] freedom from toxicity.

To this second series of cases the same diagnostic criteria were applied as formerly, namely: (1) a typical pneumonic history; (2) physical and X-ray signs of lung consolidation; (3) the isolation and where possible typing of a pneumococcus from the sputum. Blood was also taken for culture on the day of admission, and the procedure repeated when necessary. The usual dosage employed was 4 grammes, initially followed by 2 g. every 6 hours, a scheme which was found to be generally effective in maintaining an adequate blood-concentration and in bringing about a rapid improvement in the patient's condition. Nevertheless, when a patient was in poor condition it was deemed wise to give the drug every four hours for the first 24 hours to ensure a satisfactory blood-level. When there was a poor clinical response to the drug the sulphonamide blood-concentration was estimated and if it was below 5 mg. per 100 c.cm., the sodium salt was usually given intramuscularly until the clinical condition improved.

Many of the patients had been given sulphapyridine before admission to hospital, usually in so small doses as to have little effect on the course of the disease. Confusion would arise in these cases when the patient vomited during the first 24 hours after admission, but almost invariably this symptom disappeared without our discontinuing the treatment, indicating that sulphapyridine was the probable cause of the emesis.

Since our favourable preliminary report on sulphamezathine other papers describing its use in pneumonia have appeared. Peters and Easby (1943) found a case-fatality of just over 4% in 77 cases of pneumonia in a [illegible] Morgan and Wylie-Smith (1943) made a [illegible] of sulphapyridine, sulphadiazine and sulphamezathine in the treatment of lobar pneumonia. They confirmed the efficienc of sulphamezathine and its relative freedom from harmfu side-effects; it was used in 68 cases without a death. Melto in 1944 had a case-fatality of 6·7% in 134 cases of loba pneumonia and a rate of 11·1% in 179 cases of a sulphapyi dine series; ill effects were slight though there was occasiona leucopenia. Jennings and Patterson (1942) reported that the drug was well tolerated and effective in children.

The efficiency of the drug in curing pneumonia thu appears unquestionable and the rareness of toxic r actions has been confirmed by all who have [illegible] their results. Our cases comprised 200 males and [illegible] females. There were 24 deaths, giving a ca[illegible] of 8·4%. All deaths occurring within 24 hours of a mission to hospital have been excluded as tending obscure a true estimation of the value of the [illegible] Even so, the death-rate is slightly higher than in first series (6·7% of 71 cases) though it cannot be [illegible] sidered unsatisfactory when the age-groups in table are studied. It is then seen that of 24 deaths, 23 in the 40-plus groups, and of these, 22 are in [illegible] over 50. The unusually high proportion of patients these later decades is almost certainly responsible f the slightly higher total mortality than in our [illegible] series and in the other series quoted (see table II). T average age of all patients on admission to hospital is

TABLE I—RELATION OF AGE TO CASE-FATALITY

Age-group (yr.)	Cases	Deaths	Per cent.
16–39	123	[illegible]	0·8
40–49	61	[illegible]	1·7
50–59	45	[illegible]	20
60–69	48	[illegible]	20
over 70	10	[illegible]	[illegible]

present higher than formerly on account of home nursing difficulties, and many elderly patients are admitted desperately ill for lack of necessary attention.

In cases which do not respond quickly to the drug the value of estimating the sulphonamide blood concentration has been repeatedly proved. Fairly often, through failure in absorption or for other reasons, the blood-level was found to be low but was quickly corrected by the intramuscular injection of the sodium salt. It may be added, that during the recent influenza epidemic patients who were desperately ill when admitted were restored to comparative ease in a few hours by an immediate intravenous injection of 3 g. of the drug; the effect was impressive.

TABLE II—COMPARISON OF AGE INCIDENCE WITH OTHER REPORTS

—	Under 40 yr.	Deaths	Per cent.	Over 40 yr.	Deaths	Per cent.
Don et al.: Sulphapyridine ..	70	2	2·9	49	6	12·2
Macartney et al.: Sulphamezathine ..	37	1	2·7	36	4	11·1
Morgan and Wylie-Smith: Mixed series	281	8	2·8	210	38	18·1
Present series	123	1	0·8	161	23	11·0

Owing to the difficulty in obtaining supplies of sera, pneumococcus typing could not be continued throughout the investigation; but the result of 147 typings given in table III shows that, as in our previous observations, type 1 infection is still by far the commonest. It is interesting to note that in Glasgow type 2 infections are much more common than type I (Anderson 1944). A positive blood-culture was obtained in 44 patients (15·3%), of whom 9 died, a proportion which compares [illegible] ce (Don et [illegible] Generally [illegible] d, so it is [illegible] by paren- [illegible] a measure which generally gave [illegible] bacteræmic cases are included in [illegible]

TABLE III—INCIDENCE OF PNEUMOCOCCUS TYPES

Type	No.	Type	No.	Type	No.	Type	No.
1	76 (26)	6	1	13	1	23	2
2	19 (3)	7	4	14	1	25	1
3	18 (3)	8	5	15	1	..	..
4	2 (1)	10	1	18	1	..	..
5	12 (7)	11	1	22	1	..	..

TABLE IV—INCIDENCE OF COMPLICATIONS

	No.	Per cent.		No.	Per cent.
Serous effusion	11	3·8	Endocarditis ..	3	1·0
Empyema ..	3	1·0	Lung abscess ..	2	0·7
Pericarditis ..	4	1·4	Jaundice ..	2	0·7

[illegible]. The incidence of complications in this series was remarkably low judged by clinical, radiological and post-mortem examinations. It is possible that a few serous effusions were missed owing to extensive underlying consolidation, but the figure is [illegible]

Toxicity.—Our experience with our first series in regard to toxicity is again borne out. A rash appeared on 6 patients; 7 complained of nausea and 11 vomited; there were 2 cases of drug fever and 2 of leucopenia. In no case did vomiting cause cessation of treatment. Both cases of leucopenia recovered quickly when the drug was discontinued. There were no renal complications and no cyanosis. There is thus ample proof that this drug is one of the least harmful of the sulphonamides and is well tolerated.

FATAL CASES

The efficiency of sulphonamide treatment in pneumococcal lobar pneumonia is such that special attention must be paid [illegible] which prover [illegible] o assess the factors being present [illegible] one factor often [illegible] sent series are 24, while in our previous series of 71 cases there were 5 deaths. It is convenient to study them together: they seem to fall into 6 groups.

1. *Inadequate drug concentration in the blood.*—This seems to have been the cause of death in 5 patients, and the following case illustrates the group:

CASE 1.—A man of 57, subject to chronic bronchitis, had a severe type 5 pneumonia affecting the whole of the left lung. Admitted on the 10th day, he died on the 14th, and during this time had 44 g. of sulphamezathine by mouth. Blood-levels on the 10th and 12th days were 1·1 and 3·0 mg. per 100 c.cm.; 3 g. of the drug was given intramuscularly on the 13th day, and the blood-level raised to 5·3 mg. per 100 c.cm., but this measure was both inadequate and too late.

The question whether the patient is actually maintaining an effective concentration of the drug needs careful consideration in every case. As a rule 24 hours must elapse before one can be reasonably sure of a satisfactory response to treatment, and the loss of this time may make all the difference to the final result. Whether low blood-levels are due to faulty absorption [illegible] not easy to prove in these [illegible] inly true that a low blood- [illegible] by a relatively high concen- [illegible] inactive form. Parenteral treatment is easy and safe, with due precautions, and is necessary in a definite proportion of cases. In the light of our experience, we feel that the drug should be given by injection as well as by mouth during the first 24 hours in all severely toxic cases and in all cases seen after the 7th day of disease, and that a blood estimation of the drug should be made daily until the clinical condition is clearly satisfactory. In addition, the amount of the drug in the blood should be estimated in any case which fails to show decided clinical improvement after 36 hours' treatment by mouth.

2. *Late heart-failure.*—Three patients died of myocardial failure more than 2 weeks after the pneumonic toxæmia had been overcome and the lung was resolving well. Two were men over 65, each with a severe infection and positive blood-culture [illegible]

[illegible] we have [illegible] endocarditis. For some years [illegible] ance o [illegible] quency and importance [illegible] and a [illegible] ath in pneumonia. made [illegible] sis of 20 cases was The cl [illegible] and Smith 1943). [illegible] easy unless the possibility of endocarditis is borne in mind when pyrexia persists, even if other complications such as empyema or pericarditis are found. Petechiæ are few and usually terminal, the spleen is palpable in only 10%, and the cardiac signs may be very difficult to assess. [illegible] autopsy is performed in every fatal case of [illegible] the true incidence and importance of [illegible] endocarditis as a cause of death will [illegible] underestimated.

It is not clear at what point in the course of acute pneumonia the endocardium becomes infected. In some it is probably early, in which case sulphonamide therapy would probably act as usual on the pneumonic process but would fail to check the developing threat to the endocardium. In others infection of the endocardium may have resulted from an empyema which acted as a reservoir for virulent pneumococci which were carried via the pulmonary veins to the left heart. The following is a typical case in this series.

CASE 2.—A man of 56 had acute pneumonia and was treated at home with sulphapyridine. A week before admission he had a rigor. When first seen, he had a right-sided empyema containing type 1 pneumococcal pus, with a positive blood-culture. His blood-pressure was then 115/70 mm. Hg. A week later an aortic diastolic bruit became audible, and the blood-pressure was 120/55 mm. Hg. The spleen was never palpable, and not until 4 days before death were petechiæ discovered, on the conjunctivæ only. Although there were no clinical signs of meningitis, the cerebrospinal fluid taken a week before death, though sterile, contained 225 polymorphonuclear cells per c.mm. Blood-culture was positive on 3 out of 4 occasions. Sulphamezathine, totalling 128 g., was given by mouth over 14 days, and a toxic rash developed 2 days before death. Autopsy revealed typical vegetations of pneumococcal endocarditis on the aortic cusps.

4. *Chronic bronchitis and bronchiectasis.*—These conditions are generally recognised as of serious prognostic importance in pneumonia. Of our 24 deaths, 13 were in patients described as "chronic bronchitic." Apart from the structural damage to the heart, lungs and respiratory mechanism resulting from chronic bronchitis, mixed infection is common. One such patient in this series had a type 2 pneumococcus, a Friedlander's bacillus and a *Staph. aureus* (coagulase-positive) in the lung, which was in a state of gangrene. Most of such patients were over 50 years of age, but the following illustrates the serious results of pneumonia complicating bronchiectasis in a man of 29.

CASE 3.—The patient was admitted on the 16th day of a pneumonic illness, and a radiogram showed an abscess in the left lower lobe. Great general improvement resulted from treatment with sulphamezathine by mouth and parenterally, high blood-levels being attained; 26 days after admission there was serious recurrence of infection in the right upper lobe. Autopsy revealed bilateral bronchiectasis in the lower lobes, interlobar empyema, and a typical recent pneumonia in the right upper lobe.

5. *Pneumonia complicated by chronic disease elsewhere.*—In 2 cases *chronic nephritis* was found clinically and at autopsy. Both had a severe type 1 infection, which responded well to sulphamezathine, but they died from uræmia, blood-urea levels being 211 and 163 mg. per 100 c.cm., shortly before death.

A man of 44 whose pneumonia responded well to sulphamezathine was found at autopsy to have a coarse portal cirrhosis and enlarged spleen.

6. *Pneumococcal toxæmia.*—Nine deaths were attributed to the direct effect of toxæmia, usually ending in peripheral circulatory failure. Six were men, three were women, all between the ages of 52 and 80, the average age being 68. Three had type 1 infection, three type 3, and one type 5. In four the blood-culture was positive. The actual extent of lung involvement seems significant, two lobes being involved in five of the cases. Satisfactory drug levels in the blood were attained in all, high levels (14–24 mg. per 100 c.cm.) being achieved in three, one of whom developed a toxic rash. Only three were admitted to hospital before the 7th day of disease, and the average day of death was the 14th, the limits being the 7th to the 21st. The delay in treatment seems therefore to be a significant factor. Autopsy was obtained in 5 cases, all showing grey hepatisation, and 2 had a breakdown of lung tissue with an acute abscess of the lung. It is certain that toxæmia from the pneumonia alone will cause death in spite of the maintenance of a high sulphonamide level in the blood, and this is especially true in the older patient. Abdominal symptoms, as a sign of toxæmia, may be of particular significance in acute pneumonia, as illustrated by 5 cases in this group. Tympanites is usually terminal, but may occur early in the disease. Hiccough is important as a toxic sign, quite apart from its seriousness as a symptom. In one case true paralytic ileus appears to have been the chief cause of death.

CASE 4.—A man of 52, admitted on the 8th day in a state of delirium and semiconsciousness, with type 5, pneumonia affecting the right lower lobe. He had had hiccough for 2 days. Sulphamezathine by mouth and parenterally produced striking improvement in 24 hours, but 3 days later constipation and tympanites developed and failed to respond to treatment. Grey hepatisation was found at autopsy, and paralytic ileus with flakes of fibrinous material on the intestinal wall.

SUMMARY AND CONCLUSIONS

Sulphamezathine has been used in the treatment of a further 287 cases of pneumococcal lobar pneumonia with a case-fatality of 8·4%.

Of the 24 patients who died, 23 were over 40, and of these 22 were over 50 years of age.

It is confirmed that the drug is relatively non-toxic, and that the number of complications is not high.

An analysis of the deaths in this and the previous series leads us to suggest the following points as an aid in reducing still further the mortality of lobar pneumonia.

Steps must be taken to ensure an adequate drug concentration in the blood in the first 24 hours in severely toxic cases and in those coming for treatment after the 7th day of the disease.

In older patients the heart condition should be assessed and adequate convalescence allowed.

Abdominal symptoms should be regarded as a sign of toxæmia and receive early treatment.

An undetected empyema may be one of the reasons for the development of pneumococcal endocarditis.

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SPREAD OF INFECTIVE HEPATITIS*

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THIS paper is based on an epidemiological study of infective hepatitis among New Zealand soldiers at Alamein in 1942.

OBSERVATIONS

In 1942 the 2nd New Zealand Division was togethe as a single unit in Syria and in the Western Desert until July 22. It had the normal incidence of jaundice among all units. From that date it was divided into three separate groups and the incidence of jaundice changed.

Group I.—Two brigades of front-line troops, stationed in the desert at Alamein. Involved in the epidemic.

Group II.—Medical, supply, and maintenance units stationed in the desert 10 miles to the rear. Not involved.

Group III.—One brigade of infantry which returned to base. Not involved.

For epidemiological studies the desert has the advantage that there is no additional population; many factor remain constant and equal among all troops in all areas Group I were front-line units which went into the Zealand box at Alamein at the end of July: 35–40 later hepatitis broke out among them, and it lasted un 35–40 days after their withdrawal from the area; amo 7500 men there were 1059 cases. Group II units w located 10 miles to the rear of the Alamein line. among 3900 men there were only 78 cases.

The New Zealand box was at the southern of the Alamein line. The rest of the line north to sea was occupied by British and Indian troops who not affected until later in the season but then had severe epidemic. The epidemic was thus localised in a area 5 miles square at the south [illegible] the Alamein line—a piece of barren desert, with no scrub or water or any natural feature to distinguish it from the rest of the Western Desert. As all units separated from the New Zealand Division on July 22 escaped the epidemic it was clear that the infection was introduced in this area.

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* A paper containing these data was presented by the author the 2nd MEF Medical Conference held at Cairo in 1943; and epidemic is also analysed in a thesis presented for the MD in the University of New Zealand.

At that time the one difference between the New Zealand site and the rest of the Alamein line was that it was recaptured ground. It had been occupied by Italians and Germans, and then fought over at the battle of Ruwyeisat Ridge, before being occupied by New Zealand troops; whereas the rest of the line, except in one case to be mentioned later, had been occupied and held by the British units then in possession. Within the area itself the incidence of hepatitis was greatest in the extreme south and least in the north.

INTERPRETATION

As the various possibilities were considered one was able to eliminate such factors as water, food, hardship, [illegible] ing similar among [illegible] us years New Zealand [illegible] susceptibility to the [illegible] rs which may have altered susceptibility during the stay in Syria were shared by the units detached in July, which remained uninfected. It was noted that reinforcements and rested troops were involved equally with the rest.

It seemed unlikely that some unknown vector was responsible, for no insects other than flies could be recognised in this or any other area. Against spread by droplet were the following facts:

1. There was no special incidence of catarrhal infections.
2. The men of infected units lived in groups of three or four in the open and had little intercommunication.
3. Small individual groups did not show any special tendency to infect each other.
4. Field ambulances which ultimately handled all cases as they went to the rear areas had a very low incidence.
5. Visitors to the area were frequent and did not carry the infection back to their messes and units.
6. Congestion was much less in the front line, and there were no messes or tents; whereas 10 miles to the rear men lived in tents and ate in messes and yet had no epidemic.

Clearly the site was the key, and the New Zealand box contained the reservoir of infection. There must be a mode of spread by which the virus caused cases simultaneously among many small groups scattered through the area. As flies were prevalent in incredible numbers everywhere along the Alamein line and to a lesser extent to the rear, and as diarrhœa and dysentery were rife, flies were considered the most likely vectors. The [illegible] n could only be in the affected area; [illegible] we have seen, from all other parts of [illegible] at occupied by the 9th Australian [illegible] was recaptured ground, fought over [illegible] penly contaminated by enemy fæces and dead bodies inadequately buried. We knew from patrols and prisoners that for some time there had been an epidemic of hepatitis among enemy troops opposite the New Zealand box and that many jaundiced men were kept in the front line. In the area occupied by the Australians similar conditions existed and they had a considerable number of cases at the same time as we did.

It was therefore suggested that the infection was conveyed by flies, from bodies and fæces on the infected [illegible] o were unable to protect their food, [illegible] or hands from the hordes which [illegible] erything. Once the epidemic was [illegible] was reinfected by the New Zealand [illegible] for it was never possible to achieve [illegible] nitation. The unit which occupied [illegible] Ne[illegible] epidemic at [illegible]

Reasons why the [illegible] units north were:

1. Indian troops, who (like the Maoris) possess a partial immunity, were between the New Zealand Division and British units to the north.
2. The prevailing wind was from north-west to south-east; so flies infected in the heavily contaminated Ruwyeisat Ridge area tended to travel south.

CONCLUSION

The observations here recorded made it evident that at Alamein in [illegible] infective hepatitis was spr[illegible] tion from human excreta. [illegible] that the virus must be passed in the urine or fæces or both, and that epidemics in soldiers could be prevented by adequate sanitation. This conclusion was supported by the further observation that the disease does not spread in base hospitals, prisoners-of-war cages, or anywhere where sanitation is good and there is satisfactory control of flies.

I wish to thank the many officers and men of the 2 NZ Division who assisted me in collecting data, and the DMS, 2 NZEF, for permission to publish this paper.

SIGNIFICANCE OF MITES AND THEIR EGGS IN HUMAN FÆCES

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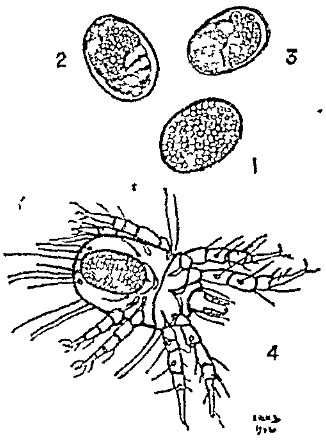
Invasion of the alimentary canal, and urinary and respiratory tracts, by tyroglyphid (and sometimes also tarsonemid) mites has been held responsible for enteritis, nocturnal enuresis, hæmaturia, and bronchitis. In the case of the alimentary canal the evidence up to 1929 has been reviewed by A. Hase.

Mites occur in foodstuffs of all kinds, but with the exception of the well-known "Altenburger" cheese, which is riddled with these acarines, their presence in these situations is both vicarious and unintentional. The most common in foodstuffs and fæces are cheese mites (*Tyroglyphus siro* and *T. longior*), next the meal mite (*Aleurobius farinæ*), and lastly the house mite *Glycophagus domesticus*, which is also often found in fruit and meat. But evidence of pathogenicity is by no means so clear. While some have thought that actual ingestion of myriads of these small creatures may cause intestinal disturbance by mechanical irritation or by the toxins they may produce, others consider that they are [illegible] Küchenmeister and Zürn [illegible] s after ingestion of "mite [illegible] 11) held that *A. farinæ* [illegible] and cutaneous eruptions, [illegible] large numbers of cheese [illegible] harm. Others (Böhm 1920, Moniez 1891, Reye 1910, Martini 1925) agreed. Kunze (1924) and Hieronymi (1925) fed *A. farinæ* to a dog for four weeks without effect. Graf Vitzthum (1925) thought that various allergic cutaneous manifestations might eventuate, depending on the sensitivity of the individual.

Mites may be real, though rare, ectoparasites or their presence may be purely accidental. Thus Khalil (1921) reported finding the eggs of mites (*A. farinæ*) in the fæces of 8% of 130 Cornish miners and the adult ins[illegible] nent brought up [illegible] urinary tract wa[illegible] who found *A.* [illegible] in rectums with nocturnal [illegible] some pathological role in this situation has drawn fresh attention to this subject.

The genus tyroglyphus includes the well-known cheese and sugar mites, and Hirst (1920) stated that persons whose work brings them into contact with material infested with these living creatures are apt to suffer from forms of dermatitis known as "grocer's" or "copra" itch (see also Patton and Evans 1931). The females of *Aleurobius farinæ* and *Tyroglyphus siro* are not easy to differentiate. The male of the former has a thick first pair of legs with a large tooth-like projection from the inside of the femur. The body hairs are simple; none are pectinated and none are as long as the body. In *T. siro* in the female the vulva is placed on a slight heart-shaped elevation and the tarsi are shorter than, or equal to, the third and fourth joints added together (Michael 1903).

In 1921 one of us published figures of a mite and its egg in human fæces (Manson-Bahr 1921), and from time to time we have seen them in fæcal specimens, but the acarines were invariably dead and no signs of development were traced within the eggs. During the past year, however, we have again been meeting them with increasing frequency and have paid little attention to them thinking that they had been ingested in the food and passed unchanged through the alimentary canal. But recently two freshly passed fæcal specimens from two different people revealed eggs in development from the morular stage to that of the newly hatched nymph. A fully developed adult female (fig. 4) was discovered containing an egg ripe for extrusion. At first sight the eggs (fig. 1) suggested by their size (0·12 mm. × 0·07 mm.) and appearance those of some intestinal trematode, but the shell is by no means so dense or so well-defined and moreover lacks an operculum. The segmenting stage roughly resembles that of a large ancylostome egg, but measurements are naturally much larger (0·1–1·2 mm. × 0·07 mm.). Specimens of fæces containing the eggs mounted in saline on slides and covered with sealed coverslips were kept under observation at room temperature in damp petri dishes for 36 hours. The development of the eggs, the budding of the larval legs, and the formation of its cephalothorax inside the egg to the emergence of the nymph could be followed (figs, 1, 2, and 3). It has been difficult to identify the mite with any degree of accuracy, for only females have so far been found, but they are probably examples of *Tyroglyphus siro*, judging by the characters already mentioned. It can be realised that in such a dense medium as fæces, and with the distortion caused by the coverslip, the exact position and length of the hairs and other minutiæ are difficult to discern.



Tyroglyphid mites in freshly-passed fæces. 1. Freshly laid egg. 2. Morular stage. 3. Egg containing fully segmented larva. 4. Adult female *T. siro* in fæces containing ripe egg.

The patient from whom this last specimen was obtained had been examined for recurrent attacks of diarrhœa. He came from the Isle of Man, where he had eaten quantities of over-ripe cheese, but what particular kind we have been unable to ascertain. Efforts to find similar mites in the rationed cheese now being sold have so far failed. But the evidence suggests that this is the cheese mite and that it is capable of developing in fæces during their passage through the intestinal tract. We are publishing these observations, which are admittedly incomplete, with the idea of assisting others to recognise the eggs in the fæces, where as far as can be ascertained their presence has no pathological significance. Neither of the two patients found to be harbouring the mites showed an eosinophilia of over 5%.

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NEW TECHNIQUE OF SPINAL ANÆSTHESIA

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EVEN today spinal anæsthesia is frequently induced by empirical methods with the result that its action is sometimes capricious and occasionally dangerous. Much has been made of the safety factor of the dorsal curve, but it is common knowledge that total spinal anæsthesia is quite readily produced by a relatively small overdose, no matter what the position of the patient.

The spread of a spinal anæsthetic can, however, be limited if the correct strength of solution is used. If a large volume is injected, the height to which sensation will be abolished will be governed by the volume of solution and its concentration. If the concentration is reduced to the minimum which will induce spinal anæsthesia, spread beyond the area in direct contact with solution will become impossible even if the table is tilted in the wrong direction. This safety measure, which is independent of abnormalities of the thoracic curve, of the angle of tilt of the table, and to a large extent of the specific gravity of the cerebrospinal fluid, is much more trustworthy than those at present relied on.

Pannett in 1929 demonstrated that 0·5% and 1% procaine ('Novocain') were inadequate for spinal anæsthesia, but that 1·66% would induce satisfactory anæsthesia and muscular relaxation. By an experimental method Bieter and his colleagues (1936) have worked out the concentrations of various agents required to produce anæsthesia of the exposed spinal nerves of the rabbit. I have worked out by a process of trial and error the corresponding concentrations for the intact human subject (table I).

TABLE I—MINIMUM ACTIVE SUBARACHNOID CONCENTRATIONS OF ANÆSTHETIC DRUGS

Anæsthetic agent	Minimum effective subarachnoid strength (%)	
	Rabbits	Man
Amethocaine	0 05	0·1
Nupercaine ..	0·70	0 08
Procaine ..	0 9	1·25

The volume of the solutions of the various drugs employed will of course depend on the capacity of the spinal canal up to the level to which it is desired to produce anæsthesia. The published work on this subject proved rather contradictory, but again by trial and error it was found that 4 c.cm. of solution would produce anæsthesia to dermatome L1; 8 c.cm. to D10; and 12 c.cm. to D6. These levels correspond approximately to Poupart's ligament, the umbilicus, and the xiphisternum. These figures are more or less those given by Maxson (1938) for the capacity of the different parts of the spinal subarachnoid space.

TABLE II—DOSAGE OF DIFFERENT AGENTS REQUIRED TO PRODUCE SPINAL ANÆSTHESIA

Operation	Segmental level of anæsthesia	Volume (c.cm.)	Dose in mg. of		
			Procaine	Nupercaine	Decicain
Cystoscopy, hæmorrhoids, &c.	L1	4	100	5	8
Herniotomy and lower limb operations ..	D10	8	120	7	10
Laparotomies ..	D6	12	150	9	12

On the basis of these volumes and concentrations a dosage table was elaborated (table II). The drug of choice is amethocaine hydrochloride ('Anethaine,' 'Decicain,' 'Pontocaine hydrochloride'). Onset of anæsthesia is rapid, taking rather less than 5 minutes. The duration of the anæsthesia is sufficient for nearly all major surgical procedures, amounting to some 3 hours. With 'Nupercaine' the onset of anæsthesia is rather slower and the prolongation obtained by using this agent is not of much significance since there are few operations which cannot be completed under amethocaine. When procaine is employed there is a significant lengthening of the period of anæsthesia from the usual 30–40 minutes to about 70 minutes. The doses mentioned in the table below must be regarded as minima. Both volume and quantity of drug may be increased by up to 20% in tall or broad patients. When very high anæsthesia is required, as for gastrectomy or cholecystectomy, the volume should be increased to at least 14 c.cm. and the dose of amethocaine to 14 mg. and of nupercaine to 10 mg.

The volume of solution required for this technique is attained by drawing up the dose of amethocaine to be employed into a 10 or 20 c.cm. syringe and then aspirating cerebrospinal fluid into the syringe to the required volume. Only hyperbaric solutions are used and consequently the diluted solutions will also be hyperbaric; in the case of low blocks this factor will limit spread. In order that CSF may be drawn freely into the syringe the needle point must be well within the subarachnoid space. Midline punctures are therefore to be preferred to the lateral approach. Ephedrine should be injected as with any other type of spinal anæsthesia.

This technique has been used for some 200 spinal anæsthetics. The results have been in every way satisfactory.

SUMMARY

A volumetric technique of spinal anæsthesia, applicable to hyperbaric solutions, is described. Spread of anæsthesia is regulated by employing the minimum effective concentration of drug and adjusting the volume of solution so as to reach the required nerve-roots. The method possesses the advantages of the standard Howard Jones technique but onset of anæsthesia is much more rapid and the patient need not be turned.

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CREAMS FOR TESTING THE SENSITIVITY OF ORGANISMS TO BACTERIOSTATICS

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With the steady production of new chemotherapeutic substances and the development, during treatment, of insensitive bacterial strains, tests for the sensitivity of organisms to bacteriostatics have become increasingly important. Four methods are in common use:

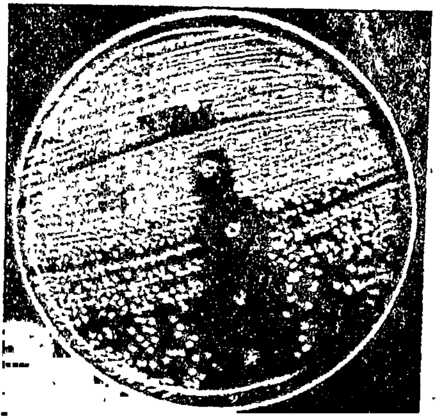
1. The ditch-plate method (Francis 1942).
2. Cup method (Abraham et al. 1941)
3. Agar-hole method (Fleming 1942).
4. Application of paste (MRC War Memorandum No. 10).

[illegible] time-consuming if a [illegible] l against more than [illegible], though quicker, is relatively inaccurate, but we have used it as a basis for the development of a qualitative test which can be employed with any antiseptic or antibiotic. The method is simple and we have demonstrated it to be reasonably accurate.

For penicillin sensitivity tests a cream was prepared according to the directions given by Clark et al. (1943), the final concentration of penicillin being 200 units per gramme. The cream is kept in the refrigerator and test [illegible] coc[illegible] s give[illegible] n for 9 months. Propamidine cream was prepared by using 1 in 10,000 concentration in a water-miscible base, such as Halden's emulsifying base, but results were not as consistent as those obt[illegible] jelly prepared by May an[illegible]

For tests other than sulphonamide sensitivity, a confluent growth of the organism is made either on an agar or a blood-agar plate.

The creams are applied in the centre of quadrants of the plate by the use of a Hagedorn blood-taking needle with three cutting edges. The needle, conveniently mounted on a metal holder, is flamed and thrust for ⅛ in. into the cream and then pushed vertically into the agar plate until the point comes into contact with the bottom of the petri dish. The needle is rotated and withdrawn and a small amount of cream is thereby removed and remains in the track of the needle. After fl[illegible] quadra[illegible] incubat[illegible] 16 hours later.



Sensitive strain of staphylococcus showing inhibition by a sulphathiazole cream.

For testing the sensitivity of organisms to sulphonamides the agar plate is made with nutrient agar free of *p*-aminobenzoic acid. A heavy inoculum having been placed on one side of the plate it is carefully thinned out by parallel strokes of a platinum loop, the success of the method depending on the gradual and steady thinning out of the inoculum. Five insertions of cream are used at equal intervals across the plate. Although complete inhibition is often not obtained where the bacterial growth is confluent inhibition becomes obvious where the growth is thinner if the organism is sensitive to the sulphonamide used.

RESULTS

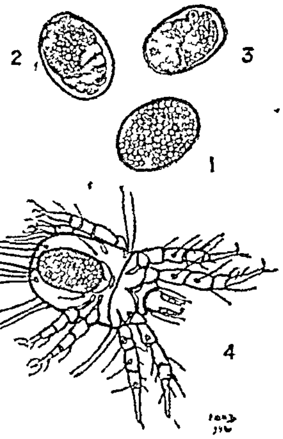
Twenty strains of staphylococci sensitive to penicillin were tested by the agar-cup method, using dilutions of penicillin of 10 units per c.cm. and 1 unit per c.cm., and the results compared with the corresponding inhibition by penicillin cream. The cream produced rings of inhibition of average diameter of 19·5 mm., all figures lying between 15 and 23 mm. Penicillin solution 1 unit per c.cm. on the same strains gave an average diameter of 19·7 mm., all figures lying between 15 and 24 mm. The 10 unit per c.cm. solution gave zones of inhibition averaging 28·4 mm. diameter, figures varying between 24 and 38 mm.

Twenty tests with penicillin cream by this technique were carried out on one sensitive strain of staphylococcus; [illegible] ed by less than 3 mm. [illegible] inhibition by the cream [illegible] cups.

Similar correlation was obtained with staphylococci and streptococci when tested with propamidine jelly and a 1 in 10,000 propamidine solution in agar cups; in all cases if inhibition was produced the ring given by the jelly corresponded to that obtained with the solution.

No numerical comparison can be made between the sensitivity of organisms to sulphonamides as shown [illegible] the ditch method of Francis and that produced by

In 1921 one of us published figures of a mite and its egg in human fæces (Manson-Bahr 1921), and from time to time we have seen them in fæcal specimens, but the acarines were invariably dead and no signs of development were traced within the eggs. During the past year, however, we have again been meeting them with increasing frequency and have paid little attention to them thinking that they had been ingested in the food and passed unchanged through the alimentary canal. But recently two freshly passed fæcal specimens from two different people revealed eggs in development from the morular stage to that of the newly hatched nymph. A fully developed adult female (fig. 4) was discovered containing an egg ripe for extrusion. At first sight the eggs (fig. 1) suggested by their size (0·12 mm. × 0·07 mm.) and appearance those of some intestinal trematode, but the shell is by no means so dense or so well-defined and moreover *lacks an operculum.* The segmenting stage roughly resembles that of a large ancylostome egg, but measurements are naturally much larger (0·1–1·2 mm. × 0·07 mm.). Specimens of fæces containing the eggs mounted in saline on slides and covered with sealed coverslips were kept under observation at room temperature in damp petri dishes for 36 hours. The development of the eggs, the budding of the larval legs, and the formation of its cephalothorax inside the egg to the emergence of the nymph could be followed (figs, 1, 2, and 3). It has been difficult to identify the mite with any degree of accuracy, for only females have so far been found, but they are probably examples of *Tyroglyphus siro,* judging by the characters already mentioned. It can be realised that in such a dense medium as fæces, and with the distortion caused by the coverslip, the exact position and length of the hairs and other minutiæ are difficult to discern.



Tyroglyphid mites in freshly-passed fæces. 1. Freshly laid egg. 2. Morular stage. 3. Egg containing fully segmented larva. 4. Adult female *T. siro* in fæces containing ripe egg.

The patient from whom this last specimen was obtained had been examined for recurrent attacks of diarrhœa. He came from the Isle of Man, where he had eaten quantities of over-ripe cheese, but what particular kind we have been unable to ascertain. Efforts to find similar mites in the rationed cheese now being sold have so far failed. But the evidence suggests that this is the cheese mite and that it is capable of developing in fæces during their passage through the intestinal tract. We are publishing these observations, which are admittedly incomplete, with the idea of assisting others to recognise the eggs in the fæces, where as far as can be ascertained their presence has no pathological significance. *Neither of the two patients found to be* harbouring the mites showed an eosinophilia of over 5%.

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NEW TECHNIQUE OF SPINAL ANÆSTHESIA

A. R. HUNTER, M D GLASG., F R F P S, D A
ANÆSTHETIST TO MANCHESTER ROYAL INFIRMARY

EVEN *today spinal anæsthesia is frequently* induced by empirical methods with the result that its action is sometimes capricious and occasionally dangerous. Much has been made of the safety factor of the dorsal curve, but it is common knowledge that total spinal anæsthesia [illegible] a relatively small overdose, [illegible] of the patient.

The spread of a spinal anæsthetic can, however, be limited if the *correct strength of solution* is used. *If a large volume is injected, the height to which sensation* will be abolished will be governed by the volume of solution and its concentration. If the concentration is reduced to the minimum which will induce spinal anæsthesia, spread beyond the area in direct contact with solution will become impossible even if the table is tilted in the wrong direction. This safety measure, which is independent of abnormalities of the thoracic curve, of the angle of tilt of the table, and to a large extent of the specific gravity of the cerebrospinal fluid, is much more trustworthy than those at present relied on.

Pannett in 1929 demonstrated that 0·5% and 1% procaine ('Novocain') were inadequate for spinal anæsthesia, but that 1·66% would induce satisfactory anæsthesia *and muscular relaxation. By an experimental* method Bieter and his colleagues (1936) have worked out the concentrations of various agents required to produce anæsthesia of the exposed spinal nerves of the rabbit. I have worked out by a process of trial and error the corresponding concentrations for the intact human subject (table I).

TABLE I—MINIMUM ACTIVE SUBARACHNOID CONCENTRATIONS OF ANÆSTHETIC DRUGS

Anæsthetic agent	Minimum effective subarachnoid strength (%)	
	Rabbits	Man
Amethocaine	0 05	0 1
Nupercaine ..	0·70	0 08
Procaine ..	0 9	1 25

The volume of the solutions of the various drugs employed will of course depend on the capacity of the spinal canal up to the level to which it is desired to produce anæsthesia. The published work on this subject proved rather contradictory, but again by trial and error it was found that 4 c.cm. of solution would produce anæsthesia to dermatome L1; 8 c.cm. to D10; and 12 c.cm. to D6. These levels correspond approximately to Poupart's ligament, the umbilicus, and the xiphisternum. These figures are more or less those given by Maxson (1938) for the capacity of the different parts of the spinal subarachnoid space.

TABLE II—DOSAGE OF DIFFERENT AGENTS REQUIRED TO PRODUCE SPINAL ANÆSTHESIA

Operation	Segmental level of anæsthesia	Volume (c.cm.)	Dose in mg. of		
			Procaine	Nupercaine	Decicain
Cystoscopy, hæmorrhoids, &c.	L1	4	100	5	8
Herniotomy and lower limb operations ..	D10	8	120	7	10
Laparotomies ..	D6	12	150	9	12

On the basis of these volumes and concentrations a dosage table was elaborated (table II). The drug of choice is amethocaine hydrochloride ('Anethaine,' '*Decicain,*' '*Pontocaine hydrochloride*'). *Onset of* anæsthesia is rapid, taking rather less than 5 minutes. The duration of the anæsthesia is sufficient for nearly all major surgical procedures, amounting to some 3 hours. With 'Nupercaine' the onset of anæsthesia is rather slower and the prolongation obtained by using this agent is not of much significance since there are few operations which cannot be completed under amethocaine. When procaine is employed there is a significant lengthening of the period of anæsthesia from the usual 30–40 minutes to about 70 minutes. The doses mentioned in the table below must be regarded as mimima. Both volume and quantity of drug may be increased by up to 20% in tall or broad patients. When very high anæsthesia is required, as for gastrectomy or cholecystectomy, the volume should be increased to at least 14 c.cm. and the dose of amethocaine to 14 mg. and of nupercaine to 10 mg.

The volume of solution required for this technique is attained by drawing up the dose of amethocaine to be employed into a 10 or 20 c.cm. syringe and then aspirating cerebrospinal fluid into the syringe to the required volume. Only hyperbaric solutions are used and consequently the diluted solutions will also be hyperbaric; in the case of low blocks this factor will limit spread. In order that CSF may be drawn freely into the syringe the needle point must be well within the subarachnoid space. Midline punctures are therefore to be preferred to the lateral approach. Ephedrine should be injected as with any other type of spinal anæsthesia.

This technique has been used for some 200 spinal anæsthetics. The results have been in every way satisfactory.

SUMMARY

A volumetric technique of spinal anæsthesia, applicable to hyperbaric solutions, is described. Spread of anæsthesia is [illegible] concentr[illegible] solution [illegible] method [illegible] Jones te[illegible] rapid and the patient need not be turned.

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CREAMS FOR TESTING THE SENSITIVITY OF ORGANISMS TO BACTERIOSTATICS

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With the steady production of new chemotherapeutic substances and the development, during treatment, of insensitive bacterial strains, tests for the sensitivity of organisms to bacteriostatics have become increasingly important. Four methods are in common use:

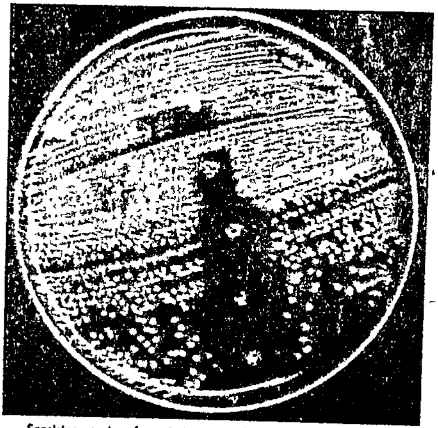
1. The ditch-plate method (Francis 1942).
2. [illegible]
3. [illegible]
4. [illegible] 10).

The first three, though accurate, are time-consuming if a number of strains have to be tested against more than one antiseptic. The paste method, though quicker, is relatively inaccurate, but we have used it as a basis for the development of a qualitative test which can be employed with any antiseptic or antibiotic. The method is simple and we have demonstrated it to be reasonably accurate.

For penicillin sensitivity tests a cream was prepared according to the directions given by Clark et al. (1943), the final concentration of penicillin being 200 units per gramme [illegible] tested at [illegible] coccus. [illegible] given a[illegible] for 9 months. Propamidine cream was prepared by using 1 in 10,000 concentration in a water-miscible base, such as Halden's emulsifying base, but results were not as consistent as those obtai[illegible] jelly prepared by May and [illegible] and sulphathiazole were p[illegible] Halden's base. Gentian-violet, proflavine, and other dyes were used in 1 in 1000 dilution in the same [illegible]

For tests other than sulphonamide sensitivity, a confluent growth of the organism is made either on an agar or a blood-agar plate.

The creams are applied in the centre of quadrants of the plate by the use of a [illegible] t[illegible] i[illegible] t[illegible] into the agar plate until the point comes into contact with the bottom of the petri dish. The needle is rotated [illegible] is [illegible] A [illegible] q[illegible] The plate is incubated overnight and the zone of inhibition measured 16 hours later.



Sensitive strain of staphylococcus showing inhibition by a sulphathiazole cream.

For testing the sensitivity of organisms to sulphonamides the agar plate is made with nutrient agar free of *p*-aminobenzoic acid. A heavy inoculum having been placed on one side of the plate it is carefully thinned out by parallel strokes of a platinum loop, the success of the method depending on the gradual and steady thinning out of the inoculum. Five insertions of cream are used at equal intervals across the plate. Although complete inhibition is often not obtained where the bacterial growth is confluent inhibition becomes obvious where the growth is thinner if the organism is sensitive to the sulphonamide used.

RESULTS

Twenty strains of staphylococci sensitive to penicillin were tested by the agar-cup method, using dilutions of penicillin of 10 units per c.cm. and 1 unit per c.cm., and the results compared with the corresponding inhibition by penicillin cream. The cream produced rings of inhibition of average diameter of 19·5 mm., all figures lying between 15 and 23 mm. Penicillin solution 1 unit per c.cm. on the same strains gave an average diameter of 19·7 mm., all figures lying between 15 and 24 mm. The 10 unit per c.cm. solution gave zones of inhibition averaging 28·4 mm. diameter, figures varying between 21 and 30 mm.

Twenty tests with penicillin cream by this test [illegible] solution in agar cups.

Similar correlation was obtained with staphylococci and [illegible] and [illegible] dine jelly all c[illegible] cups; in [illegible] was produced the ring given by the jelly corresponded to that obtained with the solution.

technique, because the width of inhibition in each case depends on the proximity of the colonies to each other. Organisms shown to be sensitive however by the former method were always inhibited by the latter, and there is considerable saving of time in the application of cream compared with that needed for the making of sulphonamide trench plates. A typical positive result obtained with sulphathiazole cream and a sensitive staphylococcal strain is shown in the figure.

SUMMARY

A rapid method is described for testing the sensitivity of organisms using antiseptic creams.

The cream method is comparable to the agar-cup and trench-plate methods and can be adapted for use with any antibacterial substance.

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METAZOAN IMMUNITY

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IN 1923, when in charge of the Sir Alfred Lewis Jones Research Laboratory in Sierra Leone, I was able to demonstrate that an acquired human immunity against a metazoan parasite was a possibility. The experiments were carried out with the larvæ of a fly, *Cordylobia anthropophaga*. This scientific name of the "tumbu" fly is sufficiently suggestive of the power which its larvæ possess of burrowing into the skin of human beings and of producing myiasis. The starting-point of the investigation was the occurrence in September, 1922, of a natural infection with nine of these larvæ, which underwent growth and development in the cutaneous and subcutaneous tissue, and were subsequently removed when 6–8 mm. long. After the lapse of 4 months repeated attempts were made to reproduce infection in the same subject by placing first-instar larvæ on his skin and allowing them to burrow into it. Although the larvæ found no difficulty in entering the skin they could not grow and develop there. In a paper by Blacklock and Thompson (1923), the evidence of the failure of these repeated infections is set out in a table. The first attempt to produce infection was made on the fingers; the remainder on the arm. The dates of the attempts in 1923, with the number of larvæ penetrating the skin shown in parentheses, were as follows: Jan. 30 (2); Feb. 18 (4); March 7 (4); March 30 (6); April 6 (12); April 10 (4); and April 23 (5).

During this work an interesting phenomenon forced itself on my attention. This was a well-marked cutaneous reaction, which in the successive experimental inoculations became progressively more extensive and striking. At each of the last six attempts at infection the local reaction was quite severe. The penetration of the larvæ was accompanied by great itching, and was followed within a few minutes by pronounced local signs and symptoms. At the point of entrance of each larva a white bleb quickly formed and spread in all directions. The larvæ were placed well apart, on an area of about 2 in. by 3 in., yet in all cases, within 50 minutes, the urticarial weals had coalesced. The irregular swelling produced was over 3 in. in diameter and raised in the centre to about ½ in. Around the white area was a zone of deep congestion which faded away at the margins. The rather tense swelling stood out clearly against the red background. At the same time severe itching was felt over the whole area affected. The pricking sensation caused by the larvæ boring in at the several points was also noticeable. By the next day the pricking sensation and both the swelling and the redness had disappeared, and the itching had to a large extent subsided.

A fairly comprehensive study of the flies (including descriptions of all the early stages and the adults), and of their habits and behaviour was contained in the paper mentioned. The finding recorded there that the wild rat is the reservoir from which man ultimately derives this infection added yet another to the long list of diseases associated with that pestiferous animal. Among the conclusions reached in the paper were—

> "An immunity has been proved experimentally to develop against attacks of the larvæ, not only in man but in animals.
>
> "The development of such an immunity in the case of cattle, in similar forms of myiasis, is considered a possibility and worthy of investigation."

This discovery, which seems to have afforded the first experimental proof of such an acquired human immunity against metazoa, was followed by further investigations. In 1927 Blacklock and Gordon published an account of work which confirmed the feasibility of producing a high degree of immunity in guineapigs against the larvæ. Photographs included in the paper showed in a striking manner the absence of damage to the skin of the immunised animal, in contrast with the very severe lesions produced in the non-immunised control, after the application of a large number of first-instar larvæ to the skin.

At this stage the Empire Marketing Board became interested, largely no doubt owing to the importance attached to the possibility of evolving a method of immunising cattle against such causes of severe and damaging myiasis as the warble fly. With the aid of a generous grant from the board attempts were made to devise a practical method of protection. Our hopes were unfortunately not realised, but this is not of course to imply that they are not capable of being realised. It may only mean that the ground was insufficiently covered. The time which could be given to the subject may have been too limited; and many routine duties had to be carried on at the same time by members of the staff. Our basic knowledge about this novel and [illegible] in those days, extremely scanty, [illegible] techniques at our disposal were hardly adequate by present-day standards. There were, in addition, the many well-recognised difficulties—not encountered in temperate climates—which militate against the success of such researches in the tropics. The results of the last part of the investigation were published in 1930.

Several American workers had, meanwhile, taken up the study of the production of experimental metazoan immunity with enthusiasm; much work was done and definite progress was recorded. In 1929 Taliaferro's monograph on the immunology of parasitic infections was published; in 1930 H. M. Miller, jun., of Washington University, published a preliminary note of his experiments on immunity of the white rat to *Cysticercus fasciolaris;* in 1931 Miller published three papers, that issued in August being on the production of artificial immunity in the albino rat to a metazoan parasite; he also published six papers in 1932, all dealing with this metazoan parasite, and describing the various methods he had devised for immunising against it.

One of the more recent American publications which give full weight to the importance of metazoan immunity is that by Culbertson (1941), in which the reader will find a useful account of immunity in such metazoan infections as helminthiasis and myiasis. Culbertson set out the various tests which have been employed for the clinical detection of these infections in man and animals—the complement-fixation test for echinococcus disease in 1906, the precipitin test for it in 1907, and the skin test in 1911—and referred to the various tests for the diagnosis of schistosomiasis (1910), trichiniasis (1928), ascariasis (1924), strongyloidiasis (1925), filariasis (1930) and similar infections.

More British workers should follow these lines of research. Many young scientists who can make full use of modern techniques and recent advances in biochemistry and allied subjects have a great opportunity in this field to make discoveries which may prove not only of academic interest but of much practical value. There is not space here even to enumerate the parasitic infections of man for which preventive measures are urgently needed. Control of the metazoan diseases, desirable enough in temperate climates, is of particular importance in those warm latitudes in which many British colonies are situated.

References at foot of opposite page

Preliminary Communications

PENICILLIN LAMELLÆ IN EYE CONDITIONS

THERE is considerable evidence that penicillin, in the form of drops containing 500 units to the cubic centimetre, is a useful therapeutic agent in superficial infections of the eyes and eyelids.[1] The disadvantage of this preparation is that solutions of calcium and sodium penicillin deteriorate, even when kept at 0° C, and tend to become infected with penicillin-insensitive organisms. The solid form retains its activity for six months or longer at room temperature. Penicillin treatment of the eyes, therefore, has been almost entirely limited to institutions where refrigerators are available, and few patients have been able to receive it at home. We have investigated other methods for the prescription of penicillin in ocular conditions. Gelatin lamellæ containing penicillin were tried, but were unsatisfactory because they were unstable and the strength of drug failed rapidly. Lamellæ of lactose, each containing 100 units of calcium penicillin, were subsequently tried. They have proved, therapeutically, as satisfactory as penicillin drops, in a small number of cases, and their potency has remained unchanged after two months at room temperature. We intend to publish our results in full later, but we suggest that this method provides a substantial advance in the use of penicillin in ophthalmology, and that it will enable it to be used conveniently in the treatment of outpatients, and also may enable the drug to be employed for eye conditions in coming campaigns in the Far East.

We are indebted to the Director-General, Royal Air Force Medical Service, for permission to publish this note, to Squadron-Leader A. C. T. Vaughan who performed the bacteriological tests, and to Messrs. Burroughs Wellcome and Co. who prepared the lamellæ.

J. C. NEELY, B M OXFD, D O, Wing-Commander RAF
A. G. CROSS, M D CAMB., F R C S, Squadron-Leader RAF

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Medical Societies

NUTRITION SOCIETY

NUTRITIONAL RÔLE OF THE ALIMENTARY MICROFLORA

THE Society met on Dec. 30, 1944, at the London School of Hygiene, when a discussion on the

Microbiology of Rumen Digestion

was opened by Mr. A. C. THAYSEN, PH D, of the chemical research laboratory, Department of Scientific and Industrial Research, who spoke of the microbiological aspect of rumen digestion with special reference to the digestion of cellulose. Very conservative estimates applied to his experimental data had shown that the dry weight of the microbial substance formed in the rumen of an ox during 24 hours was at least 400 g., containing 180 g. protein, 80 g. carbohydrate, and 8 g. "fat," and a total of 130 g. carbon. There was good evidence that this substance was digested by the host. The carbon thus made available represented some 15% of the total carbon of the ingested cellulose, amounting to some 2 kg. daily. The calculation undoubtedly underestimated the microbial synthesis; moreover, at least 11% of the cellulose carbon [illegible] acids, whic[illegible] Thaysen un[illegible] protein an[illegible] rumen.

Mr. F. BAKER, of t[illegible] Guildford, emphasised th[illegible]ultural methods of study of [illegible] he gut, and described methods of direct microscopic observation by means of which, for example, the presence of iodophil species which had never been isolated in pure culture could be disclosed.

Mr. J. A. B. SMITH, D SC, of the Hannah Dairy Research Institute, spoke of the formation of protein. Various feeding trials in this country and abroad had shown that ruminants could utilise non-protein nitrogen in the form of urea or of ammoniated sugar-beet pulp for the production of meat, milk, and wool, provided sufficient carbohydrate was present to balance all the nitrogen contained in the diet. The proportion of nitrogen supplied as urea [illegible] not exceed 40%. The principal [illegible] An ox with a rumen fistula was used. The more liquid fraction of rumen contents was incubated with urea and the synthesis of protein followed. In typical incubation experiments the urea was very [illegible], the non-protein nitrogen decreased, and there was [illegible] protein during the first 3 [illegible] calculated that some 300 g. of protein—roughly a quarter of the protein requirements of a cow yielding 2 or 3 gallons of milk daily—could be synthesised in this way. The main contributors to this synthesis were the micro-iodophil bacteria. Simultaneously with synthesis, hydrolysis of protein was observed to proceed in the rumen.

Mr. M. H. M. ARNOLD, of the research department of Imperial Chemical Industries, had calculated that the nitrogen of urea was utilised for milk-production at least as efficiently as that of blood-meal. He suggested that experiments on the utilisation of non-protein nitrogen should be of long duration to obtain predominance in the rumen of the [illegible]

Mr. S. BAR[illegible] Research in I[illegible] results of large-scale experiments on the value of urea for milk-production had been disappointing; addition of it to a diet already satisfactory depressed the milk yield and the supplement had no effect with a low nitrogen diet. The reason was probably that the practical diets lacked the readily available carbohydrate required for [illegible]

[illegible] FRS, asked whether urea fed to [illegible] milk to any appreciable extent, but Dr. Smith said that the very small quantities present would be entirely harmless.

Vitamin Synthesis in the Alimentary Tract

Mr. S. K. KON, D SC, of the National Institute for [illegible] thesis of vitamins [illegible] tract. The fact [illegible] long periods on a diet very low in certain vitamins had been noticed 30 years ago by Theiler, Green, and Viljoen working at the Onderstepoort institute in South Africa. With great foresight they attributed this faculty to the synthetic activity of the bacterial flora of the intestines. Since then the ability of ruminants to manufacture [illegible]ally the vitamin-B complex had been firmly established, and the formation in the rumen of riboflavin, [illegible] B6, pantothenic acid, nicotinic acid, and [illegible] K had been experimentally demonstrated. The [illegible] regarding vitamin B1 was curious: that [illegible] was independent of an exogenous supply of [illegible] had been proved beyond doubt, but it was possible that it was synthesised outside the rumen. The vitamins produced in the rumen were absorbed by the animal after p[illegible] through the true stomach. It had been known [illegible] long time that the intestinal flora of other animals [illegible] also able to produce [illegible] B" and that [illegible] could be utilised by coprophagy [illegible] animals. [illegible] coprophagy [illegible] non-ruminants such as rats could b[illegible] limited extent from the synth[illegible]

PROFESSOR BLACKLOCK: REFERENCES

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— — [illegible]
Culbert [illegible]
Miller, [illegible]
J. [illegible]
Taliafe[illegible]

intestinal flora. At times, however, a condition of starch dyspepsia developed spontaneously in laboratory rats, and the phenomenon first observed by Fridericia in Denmark, and called by him "refection," enabled them to grow and thrive without an exogenous supply of the vitamin-B complex. Kon and his collaborators had found that with raw potato starch, the least digestible of starches, refection became the rule rather than the exception; they advanced the suggestion that, regarding its ability to absorb vitamins produced in the intestine, the refected rat became similar to the ruminant, the cæcal region combining the rôles of the paunch and of the true stomach. A peculiar phenomenon had been noticed in the rabbit—this animal passed two types of fæces, normal during the day and abnormal at night. The night fæces, closely resembling cæcal contents in composition, were seized and swallowed by the rabbit directly from the anus and doubtless constituted an additional source of the vitamin-B complex and of other factors.

Much valuable information about the synthesis of vitamins in the intestinal tract of animals and man had resulted from the application of a new technique, making use of the bacteriostatic action of sulphonamide drugs and especially of those which were poorly absorbed from the gut like sulphaguanidine and succinylsulphathiazole. The interference of these agents with the intestinal flora affected the vitamin economy of the animal. Of the various deficiency states induced by these sulphonamides, the leucopenia, granulocytopenia, and anæmia produced were probably closely related to a disease appearing spontaneously in monkeys receiving purified diets which had been extensively studied by Lucy Wills in this country, and also to certain states in man. Dr. Kon had obtained striking effects from the administration of sulphaguanidine to refected rats which were especially sensitive to such treatment because they had to derive the whole of their supply of the vitamin-B complex from endogenous sources. He then described the observations (reviewed in THE LANCET of Dec. 30, p. 854) of Najjar and Holt in the United States, and of Ellinger, Coulson, and Benesch in this country, concerning the endogenous synthesis in man of vitamin B_1 and nicotinic acid, and also the more recent American work on the formation of riboflavine in the human gut.

Mr. L. J. HARRIS, D SC, director of the Dunn Nutritional Laboratory, Cambridge, said that partial refection of varying intensity may be a very complicating factor in vitamin-B assays, especially of starchy foods. In his laboratory it had been necessary to use with such foods the bradycardia method because the ordinary growth method gave erroneous results. He underlined the value of sulphonamides in the study of refection.

Mr. A. EDEN, D SC, of the School of Agriculture, Cambridge, spoke of his work on coprophagy in the rabbit.

Prof. L. S. FRIDERICIA of Denmark gave details of the work on refection carried out in his institute and published in Scandinavian periodicals. He emphasised the connexion between the presence of starch and the synthetic activities of intestinal bacteria, equally noticeable with the ruminant and with the refected rat. He suggested that in man the formation of vitamins in the gut might well be affected by starch dyspepsia.

Sir JOSEPH BARCROFT, FRS, Mrs. R. A. MARSHALL, Mr. A. T. PHILLIPSON, and Mr. S. R. ELSDEN, of the Animal Physiology Unit, Cambridge, spoke of the production, absorption, and utilisation of the volatile acids in the rumen. Gastric digestion in the ruminant consisted primarily of the fermentation of carbohydrate, which was followed by true peptic digestion. The carbohydrate derived from foodstuffs such as grass was for the most part digestible only by the aid of bacteria, and the efficiency of the process could be judged by the fact that more than 50% of the crude fibre of grass was utilised. The lower fatty acids—acetic, propionic, and butyric—were the principal end-products of fermentation in the rumen. The total quantities formed were substantial and the amount present in the rumen of sheep taken straight from pasture expressed as acetic acid was of the order of 60 g. There was a sharp gradient of concentration of the fatty acids along the alimentary tract, an abrupt fall taking place in the abomasum or fourth stomach. Experimental evidence showed that this was due to direct absorption of the acids from the rumen, reticulum, and omasum. The blood draining the rumen contained more of these acids than blood from other parts of the alimentary canal or than peripheral blood. The total amount absorbed in this way by a sheep was of the order of 100 g. a day, or about a sixth of the intake of available carbohydrate, and there was no doubt that the ruminant took its vinegar as a food and not as a relish. The lower fatty acids were easily utilised, acetic acid better than propionic, and the perfused rabbit heart made, if anything, better use of acetic acid than of glucose. The mode of utilisation was under investigation by indirect calorimetry, by the use of acetic acid with labelled carbon, and by experiments with phloridzinised animals. The study of the bacterial flora of the rumen had indicated that yeast-like organisms, iodophil cocci, and members of the genus propionibacterium were definitely associated with the fermentation of carbohydrate.

Reviews of Books

Tropical Medicine

(5th ed.) Sir LEONARD ROGERS, MD, FRCS, FRS; Sir JOHN MEGAW, MB. (Churchill. Pp. 518. 21*s.*)

THIS well-known textbook has now undergone more extensive revision than in any previous edition. Portions of some sections, notably those on malaria, the leishmaniases, the trypanosomiases, the dietetic disorders, and the fevers of the typhus group, have been rewritten. While the original scope and general arrangement of the volume have been adhered to and additional information has been inserted, the additions have been countered by condensation of matter already there. Its actual bulk has even been reduced by cutting the margins and by using a thinner war-time paper. This is important for Service medical officers overseas, who will find "Rogers and Megaw" a handy companion.

Annual Review of Physiology

Vol. VI. Editors: J. M. LUCK; V. E. HALL, Stanford University. (Lewis. Pp. 630. 31*s.* 6*d.*)

THE forebodings inspired by an introductory lament (in verse) to this volume over the defection of certain too-busy reviewers are not fulfilled. The surviving reviews are a little longer than the average, a little more inclined to the narrative form—both desirable qualities—and as comprehensive as war-time conditions allow. It is encouraging to notice that the editors are alive to the demands of the times, and we welcome a newcomer to the contents in the shape of industrial physiology. Two or three authors have given their subjects a personal bias, and the reader a refreshing change. Now that the *Annual Review* has become established, the editors can afford sometimes to encourage the treatment of a special department of a subject. The pool of reviewers which can still be drawn upon is impressive. Three contributors are English, and we hope that as conditions improve a sprinkling of other foreign reviewers may be secured, even if their contributions have to be translated.

Practical Anæsthetics

J. ROSS MACKENZIE, MD ABERD., DA, lecturer on anæsthetics, University of Aberdeen, senior anæsthetist, Royal Infirmary, Aberdeen. (Baillière. Pp. 136. 10*s.* 6*d.*)

THE name of the author, the title, and the opening paragraph of the preface of this book raise high hopes, but the contents are a little disappointing. It is scarcely the "foundation on which the . . . hospital resident may build the practice of anæsthesia" which Dr. Mackenzie hoped to make it. Thus, on the first page, the reader is referred, for a rapid and useful estimate of the physical condition of the patient before and during operation, to Moots's Index. In discussing aperients it is stated that the regular normal daily stool need not be disturbed except at the request of the surgeon. Some errors have crept into the drawing and legends of the illustrations, and the text does not escape minor errors. Stress is laid on the choice of anæsthetic agents for particular operations, but the advice given could be more helpful.

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THE LANCET

LONDON: SATURDAY, JANUARY 20, 1945

The Infected Hand

IMPAIRED function of the hand is so serious a handicap to the man or woman who has to earn a living that the prevention and treatment of infections in this area must be looked on as a major problem. Better prophylaxis has been attained in the past few years through the expansion of industrial medicine. The industrial nurse is responsible for seeing that roper regard is paid to all the small pricks and brasions to which factory workers are liable, and that xpert attention is obtained where necessary. Further nprovement along these lines, with special instruction for works doctors and nurses, could well be ncouraged. In treatment there remain the old rinciples, the chief of which is that the infected part hould be put at rest. Systemic administration of ulphonamides early

nuch to improve r

esions. Systemic

ot only against st

nore destructive and less responsive staphylococcal nfections. Local chemotherapy, however, is less atisfactory, because access to the whole infected rea is difficult and interferes to some extent with ocal rest. Failure to immobilise an inflamed finger will increase the inflammatory exudate and therefore the subsequent stiffness, as

of infection. Hence the loc

requiring dressings at les

justification by results incontestably better than those from general chemotherapy, rest, well-timed incision, and rest again. FLOREY and WILLIAMS[1] have shown that such results may indeed be claimed, though their "control" cases might have provided better competition had they had less frequent dressing, no saline baths, and continuous plaster immobilisation. The diminished fibrous-tissue reaction which they observed with penicillin should lead to quicker and better return of function

The best time for incision is still controversial and largely a matter for decision in the individual case. The general rule is to await localisation before interfering, but there are areas where this is to court trouble; pulp infections are an example. To give local penicillin access to the infected tissues, very early and rather bold incision—sometimes through uninfected areas—is practised; and here again the sacrifice of well-worn surgical principles can only be justified by results. The treatment of tendon-sheath infections, the most serious of all, is still unsatisfactory. BUTLER[2] notes a relatively better prognosis in streptococcal cases, for which he advises a small incision in the proximal part of the sheath and plaster immobilisation. He gives a hopeless prognosis for staphylococcal tendon-sheath infections, in which he says the tendon always dies and bones and joints become infected whether the incision is early or late. It is here that FLOREY and WILLIAMS offer some hope of help from penicillin. One common difficulty is to detect exactly which tissues are infected. A bloated and very painful finger, possibly with one or more sinuses, often gives no real indication whether the sheath is infected or not. Careful enlargement of existing sinuses and inspection in a bloodless field may show that the sheath is swollen and roughened, and the contents turbid; but the diagnosis may not be easy, and accuracy is particularly important when penicillin is used, because this substance will not cross membranes such as tendon sheaths, by whatever method administered.

The dressing applied after incision must not make

dressing must not be irritating; and in this connexion the unpleasant and protracted skin reactions that may follow external application of sulphonamides should be remembered, though they are uncommon when the application is to so small an area as the finger. SMITH[3] notes that a thin serous discharge from the wound may be an early sign of sulphonamide sensitivity. The dressing should preferably not stick, and of course where there is much discharge this will not happen whatever is put on. Finally, the dressing must allow adequate drainage. The one that perhaps meets these requirements best is tullegras with a light dusting of sulphathiazole powder, the whole being encased in plaster for several days at least.

Cavernous Sinus Thrombosis

BACTERIA may invade the cavernous sinus by six different routes—the six anatomical venous communications—and the result may be an acute thrombophlebitis or a slow obliteration of the sinus. Invasion along any route may give rise to either clinical type of infection, but the commonest combinations are acute infection from anterior veins, and slow obliteration from posterior veins. EAGLETON'S monograph,[4] which contains examples of all the possibilities, is almost terrifying in its disclosure of dreadful results from the most trivial wounds and infections of the face, but fortunately the vast majority of cases of aural and nasal suppuration avoid the catastrophes he describes. The symptoms and physical signs in acute fulminating cavernous sinus thrombosis are striking enough to impress the most ca

ment should never await their

source of infection is a septic lesion of the face with spread along the veins entering the sinus anteriorly. Erythema of the eyelids and dilatation of the superficial veins appear early, and are followed by proptosis, chemosis, and papillœdema. These signs are due partly to the venous obstruction and partly to lymphatic engorgement and blockage; sometimes also to pus in the orbit. In addition, there are the manifestations of general blood-stream infection: swinging temperature, rigors or chills, sweating, and formation of metastatic abscesses. The chronic cases arise chiefly from aural suppuration with retrograde thrombosis from the lateral or sigmoid sinuses along one of the petrosals. This is usually a process sufficiently slow for a collateral circulation to form. Consequently the classical signs of venous obstruction are absent or transient, although subsequent phlebitis of

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1. Florey, M. E., Williams, R. E. O. *Lancet*, 1944, i, 73.
2. Butler, E. C. B. *Lond. Hosp. Gaz.* June, 1944.
3. Smith, C. H. *Ann. Surg.* 1944, 119, 266.
4. Eagleton, W. P. Cavernous Sinus Thrombophlebitis, New York. 1926.

the sinus wall or of the ophthalmic veins may cause chemosis and exophthalmos. The diagnosis is difficult and cases may pass unrecognised. Rarer forms of thrombosis follow spread along the pterygoid venous plexus or from the sphenoidal or other nasal accessory sinuses, or from direct contact with acute suppurating petrositis, and each may give rise to the acute or chronic syndrome.

Whatever its underlying cause, venous thrombosis must be regarded as a protective mechanism following on phlebitis. The thrombus may be aseptic—that is, the body defence may have overcome and destroyed the infecting organisms before or while the clot is forming—or septic, when this attempt has been unsuccessful. It is in this way that to the local effects of venous occlusion may be added the general ones of toxæmia together with septicæmia or pyæmia. Treatment must be directed against the general effects of the infection, and may also be needed to relieve the local effects of venous obstruction, since these can be disastrously incapacitating. But it is essential to remember that the thrombosis is a part of the natural mechanism of repair tending to a spontaneous cure. These principles have long been appreciated and attempts have been made to apply them in cavernous sinus thrombosis by direct surgical attack on the sinus itself and its tributaries and by more conservative methods such as serotherapy, blood-transfusions, and chemotherapy. In reviewing the cases successfully treated up to 1936 Cavenagh[5] found that out of a total of something less than 50 cases (the number is uncertain owing to overlapping references and doubtful diagnosis) probably not more than 7 were of the acute infective type. Treatment by radical operation was adopted in 3 of them. Of the remainder, only 2 had been treated by operation on the sinus itself; the others cleared up with surgical eradication of the primary source of infection and of any localised areas of suppuration. Conservatism is a good rule in treating acute pyogenic infection of the sinus, operation being reserved for cases where pus has formed or there is necrosis of bone. Other methods of meeting the original onslaught of the infecting organisms are essential, preferably those acting in harmony with the normal body processes. Eagleton (pp. 156–7) prophetically wrote: "The nature of the pathological anatomy of thrombophlebitis . . . would appear to be favourable for treatment by sterilisation of the blood-stream by . . . bactericides. . . . In the near future there will be discovered specific chemical compounds which will influence the different pyogenic infections of the blood-stream . . . and will be specific for (each type)." The sulphonamides and penicillin have fulfilled the greater part of this prediction. The sulphonamides are now part of the routine treatment of the early stages of an acute pyogenic infection of any severity, and their success in sterilising the blood-stream and the forming thrombus in the cavernous sinus has been recorded by Seydell,[6] Morrison and Schindler,[7] Wolfe and Wolfe,[8] and others. Since many of these sinus infections arise from superficial staphylococcal lesions it was to be expected that even greater success would be achieved with penicillin, and the hope looked like being fulfilled when, in their first series of infections treated with penicillin, Florey and his colleagues[9] restored a boy with cavernous sinus thrombosis from a moribund state to convalescence. This boy later died of a ruptured mycotic aneurysm, but subsequent cases have been more fortunate. Thus Johnstone reported in these columns on Jan. 6 a case in which complete recovery was attained although penicillin treatment was unavoidably delayed for 10 days. Full doses of a sulphonamide and penicillin would seem the most promising combination, since some strains of streptococci and staphylococci, as well as *B. proteus* and *Ps. pyocyanea*, are resistant to one or other of these drugs. Chemotherapy is likely to cure just that type of case where the outcome was formerly almost hopeless—spread of infection from anterior veins draining a septic lesion of the face—because a lesion here is plainly visible, and any divergence from routine healing, or signs of more deep-seated mischief, become rapidly obvious, so treatment can be begun in time. The osteoplastic flap of Kroenlein, evisceration of the orbit, and other dramatic operative procedures are likely to be relegated to history except for cases where thrombosis and infection reach the sinus from more obscure lesions, and even here chemotherapy may succeed in sterilising the clot before it liquefies to pus.

It has been suggested that thrombus formation can be prevented by the administration of the anticoagulants heparin and dicoumarol. In addition to 3 recoveries with heparin recorded by Lyons[10] and Schall,[11] another was reported by Muntarbhorn in our issue of Jan. 6. In all these cases full doses of a sulpha drug were also given. Lockwood, White, and Murphy,[12] too, employed heparin and dicoumarol as an adjunct to penicillin in a successful case. But with the available evidence of recoveries with chemotherapy alone, and in the absence of controls, the addition of anticoagulants cannot yet claim to have established its practical value. They may have a part to play in the cases of chronic obliterative thrombosis which arise from the lateral sinus and spread to the cavernous sinus, for if the diagnosis is made very early heparin or dicoumarol could possibly limit the extension of the clotting process. In other cases it does not seem justifiable to oppose a natural defence mechanism.

A Regional Plan

Those who put their faith in regional planning will be pleased with an interim report just issued by the medical services committee of the Yorkshire Regional Hospitals Council.[13] If this is a fair specimen of a regional plan, it is certainly encouraging—always provided the plans can be translated from paper to practice. The committee is nicely balanced between the voluntary hospitals, the medical officers of health, the university faculty of medicine, and the general practitioners of the region; which, it should be explained, covers the East and all save the southern tip of the West Riding, but not the North Riding, which relates naturally to Tees-side.

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[5] Cavenagh, J. B. *Brit. med. J.* 1936, i. 1195.

[6] Seydell, E. M. *Arch. Otolaryng., Chicago*, 1939, **30**, 429

[7] Morrison, L. F., Schindler, M. *Ibid*, 1940, **32**, 948.

[8] Wolfe, C. T. Wolfe, W. C. *Ibid*, 1941, **33**, 81.

[9] Abraham, E. P., Chain, E., Fletcher, C. M., Gardner, A. D., Heatley, N. G., Jennings, M. A., Florey, H. W. *Lancet*, 1941, ii, 177.

[10] Lyons, C. *Ann. Surg.* 1941, **113**, 113.

[11] Schall, L. A. *J. Amer. med. Ass.* 1941, **117**, 581.

[12] Lockwood, J. S., White, W. L., Murphy, F. D. *Ann. Surg.* 1944, **120**, 311.

[13] Nuffield Provincial Hospitals Trust. Yorkshire Regional Hospitals Council. 1944. 6, Butt's Court, Leeds, 1.

The proposals follow closely those made in the interim report of Medical Planning Research,[14] and it is interesting to see how these theoretical conceptions prove applicable to an actual area. An intermediate type of hospital, between the key hospital and the peripheral hospital, is introduced under the name of district hospital. It is proposed that the 3 major or divisional hospital centres should be at Leeds, Bradford, and Hull; Leeds, as the university centre, would be the main one. There would be 9 district hospital centres, all staffed by whole-time specialists. Special departments would be situated within, and be part of, a hospital centre—an arrangement beneficial alike to patients and staff. There would be no sharp lines of demarcation to prevent a patient going to a hospital outside his own area, or even his own region, if he wished to do so; and this would remove one of the biggest disadvantages of the present municipal hospital service. Throughout the plan, municipal and voluntary hospitals are treated on a par, with common visiting specialist staffs, and common central admission bureaux. In estimating staff and bed requirements, the pre-war figures are omitted since those available are thought to be unreliable. However, it stated that a 15–20 per cent. increase in general surgical beds is needed, while the increase in beds for dermatology and thoracic surgery must be several hundred per cent. Again, there will be need of twice as many general physicians as before the war, while pædiatricians should be increased seven-fold. Such figures make one wonder how the people of Yorkshire have survived so long.

Detailed reports are made on each of the specialties. Whereas the subcommittee on general practice advocates surgery by general practitioners in peripheral hospitals, the main committee expects it to die out. Again, the GPs want a resident house-officer in each of their hospitals, while the main committee apparently does not. A house-officer would certainly be needed if the visiting surgeons were to do any large volume of work peripherally; but inasmuch as his presence might be an extra inducement to the practitioner to “do a spot of surgery on the side,” he might not be an unmixed blessing. It is at the periphery that the plan seems to have been least clearly thought out; and it is here that things are most likely to go wrong, from the patient's point of view. By and large, however, the proposals appear sound; and provided the Minister of Health injects the necessary cash, the wheels of the Yorkshire regional hospital service should turn smoothly.

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[14] *Lancet* (Suppl.), Nov. 21, 1942.

Recruitment of B1 Officers.—To meet the needs of the Services in [illegible]

[illegible] others who have held a B1 post or posts for two years or more (Ministry of Health circular 180/44). The Minister of Health is not unmindful of the needs of the civilian population and he appreciates that many of these doctors have been retained to deal with Service patients treated under the Emergency Hospital Scheme, but he is advised that it is now necessary to consider their recruitment and he urges hospitals, wherever possible, to release them. Substitutes may be found among holders of A and B 2 posts, and he suggests that it will be to the advantage of hospitals after the war if these young men, who would otherwise have been recruited to the Forces, can now be given further experience. Replacements may also be found among medical officers invalided from the Forces or released on the application of the Central Medical War Committee.

Annotations

UNIVERSITY STUDENTS AS CRITICS OF FACTORY LIFE

TWENTY students from the Universities of Oxford, London, [illegible] and Liverpool spent six weeks [illegible] in a large factory. [illegible]

their stay at the factory they were encouraged to record their impressions of the social and technical side of the work. Dr. Alice Stewart and Miss Mary Lamb summarise and discuss the students' impressions of their factory life.[1] At first they thought that the welfare conditions were good, but they later realised that there were snags, and that production was hampered by a number of small irritations which, taken together, induced a cynical or indifferent attitude on the part of the workers. The students soon learnt that nothing is more certain to undermine a fundamental willingness to work than constant petty irritations and mismanagements, and they felt also that too little was done to ensure that the worker really knew what he was doing and felt it to be important. This, they thought, was the chief cause of absenteeism, slackness, indifference, and careless work. Another cause of absenteeism, particularly amongst the married women, was the delay caused by irregularity of supplies of goods essential to production. The married women, with homes to run, inevitably felt that they had something better to do than to hang around wasting time at the factory. In this factory little was done to familiarise the workers with the possible consequences of carelessness at work. The products of the factory were dangerous to the workers [illegible] who had to handle them afte[illegible] The students approached the [illegible] given a special lecture on the nature and uses of the products on which they were engaged; they were also taken on a tour of the whole factory so that they might see how the various processes were related. It was not customary to give these privileges to the other workers in the factory.

The students commented unfavourably on the general factory hygiene. They found the sanitary accommodation most unpleasant because it was only cleaned once a week; most of the time the place was very dirty and foul-smelling and there were no locks [illegible] doors. The workers ap[illegible] the factory doctors. M[illegible] be perfunctory in the extreme.

No-one who has experience of industry will quarrel with the conclusions reached by Dr. Stewart and Miss Lamb, but it is perhaps a mistake to say, as they do, that theirs is a new approach to the problem. Again, no [illegible] ld be made [illegible] which was obviously large—too large—new, and unwieldy. There had been apparently little time for personalities and processes to settle down. In old-established factories things are better. Sanitary accommodation is clean and wholesome in many of them. Workers have, and use, the power to express themselves either direct to the management or through works councils and joint production committees. Many of them make suggestions, which are accepted, for improvement in working conditions and in technical processes. In many instances the better “channels of communication” for which the authors plead are already laid down. But it nearly all depends on the people in charge and on their personalities. When the factory is small enough for each worker to be personally known to the manager, there is little or no trouble. There are of course unhappy factories, but also many happy ones, and these are usually places employing a thousand workers or less. The larger factories often have a somewhat soulless atmosphere. As for the doctors in the students' factory, it is permissible to wonder how much they were irritated and hampered by lay control and how far they were encouraged to run their own show. Doctors, as well as students and workers, react unfavourably to an unsympathetic atmosphere.

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[1] *Industrial Welfare*, Nov.–Dec., 1944, p. 175.

PREPAYMENT HEALTH SCHEMES IN THE USA

THE United States were built by individualists, pushing ever further west into a hard and unknown land. In such an atmosphere, where any man can still rise to the top by his own ability, opportunity has naturally been valued more highly than security, and self-help more than governmental assistance. This state of mind is reflected in the attitude of American doctors to social security and health service schemes. For a long time the American Medical Association did not look with favour on organised health-insurance schemes. Despite this, such schemes have developed progressively, and a series of articles in the Association's journal[1] set out details of the way in which some of them are organised. Broadly speaking, the AMA is now supporting prepayment schemes organised jointly by doctors and industry, but not those in which doctors are employed on a salaried basis by groups of the general public. Addressing the National Physicians Committee on Nov. 27, Dr. Morris Fishbein, editor of the *Journal of the American Medical Association*, said: "It is well within the desire and ability of American medicine to develop for the American worker plans for the provision of medical care which will be democratic in their conception and in their functioning and which need not serve necessarily as the basis for destruction of the American way of living."

In the main, existing prepayment services have been built up by individual industrial concerns. Entry, which is generally voluntary, is usually confined to workers earning less than $3000 (say £600) a year. Some services cover workers only; others provide medical care for dependants. Some offer a complete service including home doctor, specialist, and hospital; others offer only a partial service, perhaps with a measure of cash assistance towards the cost of non-provided treatments. The doctors are as a rule paid on a fee-for-service basis, though in a few cases they get a salary. Free choice within a list of cooperating practitioners is the rule. The disadvantage of organising a health service on a factory basis, in a country where industrial conditions fluctuate violently, is recognised by the establishment of the Michigan and Massachusetts State prepayment programmes. Michigan already has a membership of over 600,000, while in a year and a half Massachusetts has enrolled over 34,000 people. Weekly premiums vary not only from scheme to scheme but inside each scheme on a basis of current disbursements. A further variation is introduced since some schemes relate weekly premiums to incomes. The annual cost per person eligible seems to range from about $17 to $22 (£4 5*s*. to £5 10*s*.), giving an average contribution of something under 2*s*. a week, or 10*s*. a week for a man and wife with three children. Since contributions fluctuate with the total use made of the service, there is an incentive, albeit rather indirect, for the individual patient to confine his demands for medical treatment to essentials. A whole-time medical director is usually responsible for seeing that the doctors, for their part, do not carry out unnecessary treatment for the sake of the fees.

An attractive feature of American prepayment plans is that their management is usually in the hands of a joint committee, with the majority of its members elec[illegible] subscribers, and the minority by the parti[illegible] octors. Thus the two parties are encouraged [illegible] ogether for the common good. The indigent poor are generally regarded [illegible] on the community as a whole, [illegible].

A [illegible] to the story is [illegible] repo[illegible] of a Natio[illegible] Programme,[2] produced by a joint committee of doctors, medical administrators, and economists, among whose members are Solomon Bloom, Hugh Cabot, John Peters, and Kingsley Roberts. Their main recommendations are compulsory contributory insurance, payments related to earnings, free choice of attendance by patient and doctor, joint administration by doctors and consumers' representatives, and payment on a fee-for-work, capitation or salaried basis, the decision to be made by [illegible] of the local doctors. At present, according to a nation-wide survey conducted by the National Opinion Research Centre of the University of Denver,[3] 34% of people have some insurance helping to meet hospital bills, while 14% have some insurance helping to cover doctors' bills; 31% admit having been put off seeing a doctor because of the cost, 68% favour a social security plan covering medical services, and 82% think something should be done for people to get the medical care they need. The difference between the two last figures is accounted for by a minority who favour private insurance schemes.

THE CHILD WITH A CRIPPLED HEART

THE discussions accompanying the passage to the Statute Book of the new Education Act have brought to the fore the question of the education of our physically defective children. Some indication of how Chicago tackles the problem is given in a report[4] on 20 years' experience at a special school in that city for children with various physical defects. This report is concerned only with the children with cardiac lesions. It is based on 233 cases, of whom 130 had been re-examined just before the report was written, and 56 were known to have died since they left the school. Of the 233 children 85% had rheumatic heart disease and 9·4% congenital lesions. The average age at entrance to the school was 12 years. The families from which the children came were rather large, on the average, most of them consisting of four or five children. Their socio-economic status was good in 38%, fair in 39%, and poor in 23%, the school being situated in one of the poorest districts of Chicago. The 130 children whom it was possible to re-examine were equally divided between the sexes, and at the time of re-examination ranged in age from 17 to 33 years. Of the women, 32 were married, 14 had one child, 3 had two children, 1 had three children, 2 had had four pregnancies, and 3 were pregnant. In no case was there any evidence that the heart lesion had adversely affected either pregnancy or labour. Recurrences of rheumatic fever since leaving the school were reported in 20% of this group. The cardiac status of 104 of the 130 had either improved or remained the same since they left. Only 5 members of this group had never worked or were not working at the time of re-examination. The jobs they were doing were most varied, including such exclusively American ones as "26 girl," "subway mucker," and "candy packer," while their recreational activities ranged from sewing to basket-ball, speed-boating, and hunting. In assessing the significance of the mortality-rate—26% in the 233 cases—it has to be borne in mind that admission to the school depended on whether the child "by reason of disease, accident, or congenital deformity cannot attend a regular school with safety and profit"; in other words, only the severer cases of heart disease were admitted.

With notable exceptions, such as the London County Council, we in this country have been behindhand in our provisions for the rheumatic child. Too often these unfortunate children have been allowed to spend their lives wandering in and out of hospital, "interesting cases" for the student but neglected as human beings with the hopes and aspirations of youth. It is practically a decade since Ritchie[5] pointed out that "the onus of instructing the people, local authorities, and the State regarding health measures rests upon the medical profession, which has therefore the bounden duty of advising the community regarding the measures that ought to be taken to curtail the scourge of acute rheumatism. Now is a propitious time for that advice to be given." Perhaps Mr. Butler will be able to ensure that in the new educational era on which we are entering the cardiac cripple will not lack schooling.

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[1] *J. Amer. med. Ass.* 1944, **126**, 331–348.

[2] Committee on Research in Medical Economics, 1790 Broadway, New York. November, 1944. 10 cents.

[3] What do the American people think about Federal Health Insurance? University of Denver, 1944. 50 cents.

[4] Kohen, K. H., McEldowney, R. P. *Amer. Heart J.* 1944, **28**, 491.

NITROGEN BALANCE IN BURNS

THE loss of nitrogen by exudation from burnt surface has now been carefully studied. Hirshfeld and his associates[6] collected the exudate in a special dressing woven from fine glass fibres ('Fibreglass') and found that in 6 patients this accounted for 3-25% of the total nitrogen output. Co Tui and his co-workers[7] collected the exudate from two burnt patients and estimated that they lost 0·42 mg. and 2·26 mg. of nitrogen from each square centimetre in 24 hours. Taylor[8] points out that there is a well-marked tendency to a negative nitrogen balance in burnt patients because increased urinary output of nitrogen, loss of nitrogen in the exudate, increased demands of nitrogen by healing tissues, and increased requirements due to infection all accompany the body's attempts at recovery. The maintenance of a positive nitrogen balance is thus of fundamental importance, but these workers all agree that it is also extremely difficult. Various methods can be used, such as high-protein diets, which alone do not seem to suffice, or intravenous infusions of plasma, which may be difficult to maintain long enough. Co Tui and his associates believe in the administration of amino-acids, and refer enthusiastically to a substance they call 'Amigen' though they do not reveal its nature. Levenson[9] concentrates on limiting the loss of exudates from the burnt areas and advocates pressure dressings with splints or close-fitting casts, without preliminary cleansing. He insists that the pressure dressing should be applied as early as possible, that it should extend well beyond the burnt area and always to the end of an extremity, and that the pressure must be even. The perfecting of chemotherapy ar

efficient first-aid treatment of

that the burnt patient req

nitrogen intake together seem likely to make the outlook for the severely burnt patient far less dismal.

PUNISHMENT FOR ILLNESS

FOLLOWING strong recommendations by the Surgeon-General US Army, the subcommittee on venereal diseases of the National Research Council, and other eminent authorities, the government of the United States have repealed an Act of 1926 whereby personnel of the navy and army absent from duty on account of the direct effects of venereal disease due to misconduct were subjected to penalties involving forfeiture of pay.[10] The new legislation abolishes all punishment for venereal disease, which is now defined as having been acquired "in line of duty" instead of as formerly "due to wilful misconduct," provided that there has been no attempt at concealment and that at the time of infection the sailor or soldier was not an absentee or a deserter. The statute also provides that, with the same exceptions, any disability ensuing may be regarded as attributable to service as regards pension and compensation benefits.

The acquisition of venereal disease has never been penalised per se in the British armed forces, but all cases of illness or disability due to the patient's own fault, necessitating hospital treatment, are liable for hospital charges, which among non-commissioned ranks amount to eighteen pence a day. If this rule was enforced a man who broke his leg in a motor-cycle accident on an illegal or unauthorised journey would have to pay 1s. 6d. a day towards his hospital treatment, in common with men suffering from venereal disease acquired by illicit intercourse. But recently in the case of VD it has been recognised that this might lead to concealment, and the Army and Royal Air Force now follow long-standing naval practice whereby no charges are levied for the first thirty days of hospital treatment for venereal disease, those after that time being at the reduced rate of 10d. a day. With modern treatment, a stay of longer than thirty days in hospital is very rare, but it is difficult to understand the reason for what is in effect the punishment of those who fail to respond to treatment. It is understood that the medical authorities of our three Services are unanimously in favour of abolishing every vestige of penalisation, retaining of course the present punishment for concealment. But belief in the eleventh commandment—Thou shalt not be found out—dies hard.

TREATMENT OF ALCOHOLISM

IN a report lately published[1] in New York by the Research Council on Problems of Alcohol, Corwin and Cunningham argue that the primary responsibility for the treatment of alcoholism should be undertaken by general hospitals, the present-day tendency to do away with special hospitals being extended to institutions for alcoholism. Yet alcoholics are often trying patients and their numbers in America seem to be relatively large. The general hospital, therefore, for most of them would act only as a clearing station, whence each patient would be drafted to the sort of employment or specialised institution judged most suitable to his type of inebriety. The promotion of clinics for addicts in outpatient departments of hospitals is advocated in connexion with this scheme. More would be required than "jaunty sobering-up treatment," which is said to be the present limit of interest shown in alcoholics by general hospitals. But a great number of psychopathic alcoholics do not wish to abstain, and for them the recommendations of the report would be useless. The only way to deal with this group, the authors sugges

measures, which would in

England the history of the

how futile such legislation becomes in practice. The facilities for treatment of alcoholics in pre-war England, France, Germany, Russia, Sweden, and Switzerland are adjudged inadequate. In Germany the Nazis have abolished previously existing institutions and content themselves with sterilising "I

they will then drink themsel

possible. In other countries,

alcoholics fail to take full advantage of what is available. Hence again the need for compulsion, though the ills arising from attempted prohibition are admitted. In Russia all alcoholics are said to be registered and to be kept under the direction of "specialists in narcology." A questionaire, addressed by the Michigan State Hospital Commission to authorities in 47 states, and to 23 acknowledged experts, asked whether alcoholics should be treated in a separate institution; 41 replies out of 52 said yes, and 11 said no. Of 56 replying to other questions all favoured a rural rather than an urban site

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5. Ritchie, W. T. Brit. med. J. 1935, i, [illegible]

6.

Heller, C. G.

n, I., Breed,

1. Institutional Facilities for the Treatment of Alcoholism. E. H. L. Corwin, Elizabeth V. Cunningham. New York: Research Council on Problems of Alcohol. Rep. no. 7. Pp. 85.

for the institution, and 53 were in favour of legal means of detention. The length of legal detention advocated varied; a large majority favoured an indeterminate period and the bias is towards long rather than short terms. The report's leaning towards compulsion is unlikely to be regarded favourably in this country. Yet our great voluntary hospitals might consider the plea that they should act as the first line of attack on alcoholism. The emphasis of the report is on the inadequacy of hospital facilities for treatment, but it commends the educational and preventive work being carried out by temperance and other social service societies.

MEDICAL OFFICERS OF HEALTH ON THE WHITE-PAPER

THE council of the Society of Medical Officers of Health, having considered the Government's proposals for a National Health Service, have issued a report declaring that provision of hospital services has been diligently pursued by local authorities since 1930 and it would be "extremely unfortunate if the progress of this work were disturbed by transferring these services from the major local authorities to joint boards and disrupting their necessary relationships with the other health services of local authorities." The society recommends:

(1) That the medical and health functions of various Government departments be brought within one central Health Ministry with a Cabinet Minister as the responsible head.

(2) That, pending the formation of suitable local-government units, area hospital councils be established to advise the hospital authorities and the Minister as to the distribution of hospitals in the areas, and that such additional hospital accommodation as may be required be provided and maintained by existing hospital authorities, municipal or voluntary, singly or jointly, as may be necessary, in accordance with the plan as approved by the Minister.

(3) That as soon as possible the necessary steps be taken to resolve the chaos of local-government administration, special consideration being given to the needs of Greater London.

It is suggested that in any local-government area there should be a single authority for health purposes and that the extended health services should be administered, in the larger local-government areas required, by elected bodies responsible for the other services of local government.

PENICILLIN IN EYE INFECTIONS

OF the organisms commonly causing eye infections the most sensitive to penicillin are the hæmolytic streptococcus, the gonococcus, and some strains of staphylococcus. *Streptococcus viridans* and the pneumococcus are less sensitive, and staphylococci vary from extreme sensitivity to extreme resistance. It is now two years since penicillin was first used clinically as a local application to the eye and to judge from reports so far published it seems doubtful if our expectations of its usefulness in external eye disease will be realised. All agree that it is now the treatment of choice in gonococcal ophthalmia neonatorum, being an improvement on sulphapyridine for this condition, and it has also proved remarkably successful in clearing up chronic ulcerative blepharitis, hitherto a most disfiguring and resistant disease. Varied results have attended its use in catarrhal and mucopurulent conjunctivitis other than gonococcal, and in the treatment of corneal ulcer, and Keyes[1] finds that there is not much to choose between penicillin and sulphathiazole for these infections. Penicillin has been used in strengths ranging from 250 to 10,000 units per c.cm. of normal saline, the usual strength in this country being 500 Oxford units to the c.cm. If used in the form of drops the penicillin must be instilled every half-hour for acute infections, and this in itself is a handicap to its universal use. If kept at room temperature, the drops lose much of their effectiveness in 48 hours and they should therefore be kept in a refrigerator. On the eyelids penicillin ointment is useful and Keyes used 25% hydrous wool fat and 75% cold cream as a base, one gramme of ointment containing 500 units of penicillin. Neely and Cross describe in this issue a penicillin lamella, each lamella containing 100 units. The lamellæ have the advantage that they do not degenerate at room temperature and preserve their potency for a long time, being thus especially useful for Service conditions. For acute iritis due to the gonococcus there seems no doubt that penicillin given intramuscularly by injection or by drip is effective, and it is also recommended as an irrigation for the anterior chamber of the eye in severe infections and war wounds. Cashell[2] irrigated the anterior chamber in 2 cases of perforating injury with good results.

NEGOTIATIONS OPEN

NEGOTIATIONS between the Government and the medical profession on the proposals for a National Health Service opened on Friday of last week, when Mr. Henry Willink (Minister of Health) and Mr. J. Westwood (joint parliamentary under-secretary for Scotland), met the Negotiating Committee appointed by professional bodies. The committee has 31 members, 16 being appointed by the British Medical Association, 3 by the Royal College of Physicians of London, 3 by the Royal College of Surgeons of England, 3 by the Scottish Royal Medical Corporations, 2 by the Royal College of Obstetricians and Gynæcologists, 2 by *the Society of Medical Officers of Health*, and 1 each by the Society of Apothecaries of London and the Medical Women's Federation.

THE President of the United States has awarded the military decoration of the Legion of Merit to Major-General Sir ERNEST COWELL, FRCS, "for exceptionally meritorious conduct in the performance of outstanding services from September, 1942, to March, 1944," as director of medical services at Allied Headquarters in the Mediterranean. General Cowell was responsible for the medical services of the forces landing in North Africa, Sicily and Africa. He "welded together the medical services of the American and British forces and produced a highly successful organisation which resulted in the saving of many lives and contributed to the well-being and comfort of the sick and wounded of both nations."

Sir THOMAS BARLOW, FRS, consult[illegible] University College Hospital and to the [illegible] Children, Great Ormond Street, died in London on Jan. 12. He was in his 100th year.

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[1] Keyes J. E. L. J. *Amer. med. Ass.* 1944, 126, 610.

[2] Cashell, G. T. W. *Brit. med. J.* 1944, i, 420.

VOLUNTEERS FOR RELIEF WORK.—The Minister of Health (Circular 1/45) considers it right that medical officers of local authorities who are anxious to volunteer for relief work abroad should be given the chance to do so, though he stresses that the needs of public health in our own country must not be overlooked. Volunteers for posts under UNRRA, or with the voluntary societies who are members of the Council of British Societies for Relief Abroad, should therefore obtain the consent of their local authority before making application through the appointments offices of the Ministry of Labour and National Service. This preliminary assent will not, however, bind the local authority to release the applicant, and the authority will be consulted again before the officer is actually engaged. The Minister has recognised relief work undertaken in accordance with these arrangements as war service for the purposes of the Local Government Staffs (War Service) Act 1939.

Special Articles

TECHNIQUE FOR SURGICAL PHOTOGRAPHY

B. Richardson Billings, MRCS, ARPS

These notes set out the result of experiments with apparatus I have found useful in clinical photography, particularly in photography of surgical operations under aseptic conditions. The outfit is sufficiently portable to be used in ward or casualty department, and even has uses other than clinical.

The first essential is a suitable tripod. The base of this is heavy and each corner is castored (fig. 1); from this a standard rises perpendicularly, adjustable and graduated in inches; it supports at its upper end a horizontal tube (A) on which is clamped the baseboard. This simple construction gives adjustment to the baseboard (B) movable in three planes, a single nut controlling each plane: in other words, we have the much desired "universal movement." On the baseboard slides a sub-baseboard (C) to which is affixed the camera itself. This sliding movement is one of the factors governing eventual focus and size of picture. The sub-baseboard can be fixed in any selected position.

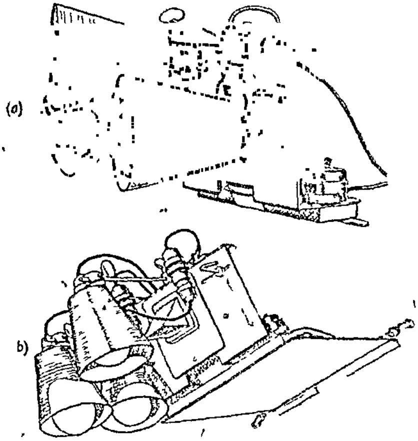

Fig. 2—(a) arrangement for "straight-through" subjects; (b) underview of sterilisable plate for operation subjects

The front of the baseboard carries—again by a single fixing wing-nut—the head, comprising illuminant and reflector.

Illumination comes from two or more shaded 'Photoflood' bulbs mounted in chosen positions round a form of lens hood (fig. 2a). The bulbs are wired in series-shunt fashion controlled by two switches, one on either side of the base, so that one or both bulbs can be used, either at half or full strength. In addition there is a central removable shaded incandescent lamp; this was found useful for focusing, since even at half power the photofloods give out too much heat to be comfortable if left on longer than the time required for the actual exposure, especially with ciné shots. Moreover, this pilot light prolongs the life of the photofloods. These can be fixed one on either side or both on the same side, and swivelled or rotated through any angle between vertical and horizontal, so fitting the needs of all conditions likely to be met. A further considerable advantage is that this part of the head may be used as a supplementary switchboard when photographing subjects at a distance from the camera.

The reflector is the crux of the idea: a mirror is housed in a removable metal hood at an angle of 45° to the optical axis of the camera, and this is always used except when [illegible]cal axis. [illegible] and presen[illegible]tion. It thus eliminates the distortion and foreshortening inevitable with the camera at any other angle or at any other distance, with or without a telephotolens. [illegible] photographs I have taken I have not met this trouble. In my latest model I have substituted a prism for the mirror, but with no more advantage than compactness of design. Reflections from moist surfaces are a far greater worry, but polarised light might solve this difficulty. The employment of mirror or prism naturally inverts the image, but this of course makes no difference in subsequent printing or enlarging.

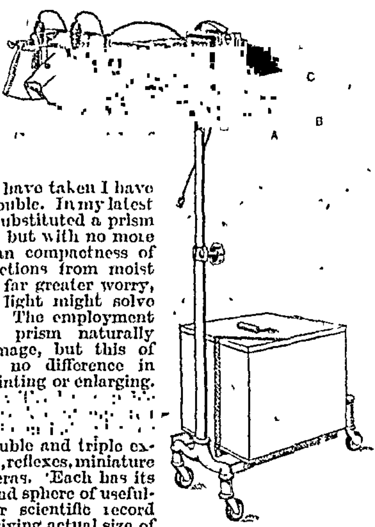

Fig. 1—General arrangement: (A) horizontal arm carrying (B) baseboard, lamps and reflectors (C) sub-base board which carries the camera.

Any [illegible] of doin[illegible] can be [illegible] film types, double and triple extension models, reflexes, miniature and ciné cameras. Each has its own domain and sphere of usefulness. But for scientific record photographs giving actual size of [illegible] be employed.

The whole head, wit[illegible] hood and mirror, is detachable [illegible], a single unit. When not in [illegible]l airtight chamber containing [illegible] is considered to sterilise it [illegible]out to be used, the head is lift[illegible] from the cabinet and fixed to the baseboard by its nut. Underneath the head a large flat metal plate can be clipped on (fig. 2b); this plate is boiled before the operation and fixed in position by one of the "clean" theatre assistants who uses a pair of ordinary towel clips to lock it in place. The front and underpart of the apparatus, which comes over the operating table, can thus be regarded as sterile; the photographer's terrain (i.e., behind and on top) is guarded from that of the surgeon.

Most of the details can be settled beforehand, so that when the surgeon is ready for the photograph it takes the photographer only a minute or less to wheel the camera into position on either side of the table, focus, light up and press the button; then the camera is wheeled out of the way.

For the photograp[illegible] copying charts and the [illegible] vertically below the mirror, which helps to standardise the work (fig. 3). The easel is a flanged frame with a plain glass bottom. The lights are brought down on to adjustable lamp-brackets to illuminate the specimen laid on the glass, below which, at a suitable distance, is a white background—a towel suffices. This gives a shadowless field. A washable celluloid footrule should be included in the picture.

Basic data of sensitive material, wattage, exposure, aperture and directions for the more orthodox "straight" clinical photography are outside the purpose

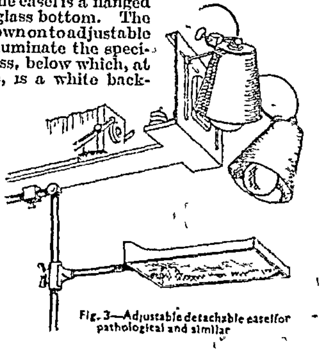

Fig. 3—Adjustable detachable easel for pathological and similar

of these notes; they are as varied as the scope of the apparatus. I hope I may have stimulated medical photographers to take up this promising side of scientific record, and manufacturers to give us the tools with which to do the job.

I am indebted to Mr. Kenneth Heritage, FRCS, senior surgeon at St. John's Hospital, Lewisham, for his cooperation and for his permission to try this apparatus over his table.

HOSPITAL FOOD

II WHAT IS GOOD FEEDING?

> "The Cure of disease by means of diet is the most wonderful part of medicine"—CELSUS AD 30.
>
> "Now good digestion wait on appetite and health on both."—SHAKESPEARE.
>
> "All nutrition work, to be worthy of our present knowledge and opportunity, must stand four square upon equal recognition of calories, protein, mineral elements, and vitamins."—H. C. SHERMAN (1925).
>
> "A dietary standard is an indication, not a rule."—ATWATER.

ENGLISH food has not always been a standing joke among foreigners. Our forebears ate handsomely, priding themselves on the variety of their dishes, and their ingenuity in seasoning them. The Normans brought their own cooking tradition with them; the *Elizabethans* were connoisseurs of the dressing of meat, game, and poultry, and their enthusiasm for the decorative trimmings of a meal gave us the good word "kickshaws." Even the Victorians ate solidly and well, and before the industrial revolution drove people into the slums of towns, cottagers' wives were cooks as notable as those still found in Scottish crofts. Our falling off in standards dates, it seems, from the last century, when many people became too poor to buy either good food or the equipment and fuel to cook it well. Cooking is an art handed from mother to daughter, and once the chain is broken it is hard to make a new beginning.

But if women have lost some of their pride in cooking, men have remained keen amateurs of good food; and when times become more normal could do much by judicious grumbling to raise the national standard. The workman's wife, for lack of means and training, may never become a fine or fancy cook, but in the interests of domestic peace she normally learns not to spoil the dishes she does tackle; and for this reason, among many others, hospital patients are particularly annoyed by the sight of good food wasted by bad cooking. They may be ignorant about dietetics, and chary of trying unusual foods, but this does not mean, as is sometimes alleged, that they are "not particular about what they eat." Within the range of foods they know they are exceedingly particular. And if they are to be introduced to new foods or methods of cooking these must be presented with first-class technique so as to overcome their initial prejudice against the unknown.

Assuming, then, that hospital patients take a serious critical interest in their food, how can we be sure of *feeding them well?*

FIRST BUY YOUR FOOD

The scientist approaches the subject of good feeding by experiment, and calculation, and estimates the standard needs of people of different sex, age-group, and occupation. These he interprets in terms of food values. The caterer, on the other hand, may be chiefly concerned to produce meals which appear attractive, but unless he or she knows something of dietetics these meals may be unbalanced and incomplete.

If feeding was designed for a machine, the scientist's approach would be the one and only way to give satisfactory results: but good feeding for live men and women is a different problem. Each has his likes and dislikes and his choice of food is influenced by habit and custom, by the food's appearance and palatability, and the surroundings in which he takes it. The hospital ought to combine the scientist's knowledge of good feeding, with the caterer's art of producing appetising meals.

First the food must be bought. This is the caterer's job, and he or she can lose the fight in the first round by doing it badly. *It is a mistake to make long-term contracts with firms, or to have a rigid system of buying.* The caterer, like the good housewife, must have his eye on the market and buy what is good today. The best, from the hospital point of view, is not necessarily the most expensive. When cherries are plentiful they are cheap, and those at either the top or the bottom price can usually be ignored in favour of those at the average price of the market. Fruits like these, which are only in season for a short time, can be given often without provoking a charge of monotony: most people are glad to eat cherries freely while they can get them. Fish also should be bought with a weather eye on the market. The steamed cod of hospital tradition should be only one item in a repertoire of fish. Cod's roes, herring's roes, and sweetbreads are sometimes to be snapped up, for the patient on a high-protein diet. Apples—in war-time no longer perennial—should be exploited fully while they are in season, especially with the coöperation of the pastry-cook; apple-pie is almost universally favoured. The caterer must have as keen a nose for a fresh food in the market as a good reporter for news; this bloodhound quality can keep the whole hospital, staff and patients alike, curious about the next meal—an excellent mood for appetite.

But he must not only buy various foods—he must buy enough of them. This fundamental obligation, strangely enough, is one in which he quite often fails, usually because the hospital committee has not been able to free itself of too great a concern for economy in the kitchens. Before the war, perhaps, it was not always easy to say what was "enough" food: but nowadays, thanks to Lord Woolton and his collaborators, we have a yardstick. Rations represent roughly our basic dietetic needs. If a man is getting those, though he may not be overfed, he is not going short. This carries the corollary that if he is not getting his rations, or getting only part of them, he *is* going short. Yet it is the custom in many hospitals not to draw the full rations for patients—presumably because the full rations exceed the quantities of food which these hospitals were buying before the war. The inference is obvious, and so is the moral. The rations must be bought in full if patients are to be properly fed.

THE COOK'S PART

When enough good food has been bought, checked, and properly stored, it must be cooked; and those responsible for cooking should have some principles in mind: meals should tempt the appetite and please the palate; they should satisfy hunger, and be digestible; and they should be *nutritionally adequate.* Meals will tempt the appetite only if menus are properly planned, and if the preparation, cooking, and service of the food are well thought out. There must be no monotony, lest the patient loses interest, and with it appetite. If the food itself is varied it is not difficult to plan well. Variety should be introduced:

Weekly.—The meals on one day of the week should never be reproduced on the same day in the following week. It should no longer be possible to hear a patient recall a special day of a week because he had a certain dish on that day.

Daily.—The same dishes should not be served on two consecutive days; and there should be no similarity between two meals on the same day.

By studying consistence.—Mastication is important. A meal should not, except in special cases, consist of two soft dishes, such as mince followed by rice pudding.

By offering a choice.—No patient should go hungry because he does not like the dish of the day.

By considering the æsthetic sense.—A nice-looking plate of food stimulates gastric secretion, and hence promotes digestion. Colour can be introduced by the use of garnishes.

APPETITE

Appetite varies with different people. In hospitals two different groups of people must be catered for: one group is the staff, who are well, active, and hungry: the other the patients having "full diet," and those who are convalescent, and whose weight is being built up. The first group need bulky meals to satisfy their hunger, whereas the second group often require a high concentration in small bulk. Menus therefore must be planned to suit the type of person to be catered for.

Patients should get enough to maintain good nutrition. Loss of weight in hospitals is all too common, even in tuberculous patients awaiting admission to sanatorium. Meals must, of course, be planned to contain proteins.

carbohydrates, fats, mineral salts, and vitamins in proper balance: and in order to achieve this it is almost essential to give three cooked meals in the day. But since the patient—especially the patient in bed—cannot digest the same type of meal as the healthy person who is leading an energetic life, the food chosen must be light, not stodgy. Food should be cooked sufficiently—not overcooked—and properly seasoned. The cook who lets dishes leave her kitchen without tasting them— [illegible]

be varied; for example lentil soup and potato soup are not seen often enough in most hospitals, except by private patients. Brown vegetable soup is often a tedious routine.

Sauces for fish and vegetables give flavour and relish, and vegetables must never be watery and overcooked. At present, when citrus fruits are almost unobtainable and the vitamin C in the diet is largely derived from home-grown vegetables, special care should be given to the cooking of vegetables, and to the time they spend in the pot or on the hot-plate. It is not good cooking to prepare and boil the vegetables early in the morning so that they are ready to serve at 10.30 AM, and to keep them in a hot closet until lunch-time.

ELEGANT AND SMOKING HOT

Patients are tempted by food which looks attractive—true and trite. And not only patients: when the Sunday joint comes to table, all set about with bread sauce, gravy, a[illegible]

[illegible] the intimacies of the dining- [illegible] reduced, and it is necessary to think of substitutes for this particular stimulus to appetite. One way is to present the food on a dish of appropriate shape and colour, and to garnish it agreeably; but this refinement is partly wasted if the patient has no chance to see it before it is served. Separate tarts or moulds often have more appeal than portions served from a large tart or mould. Salads should be served on separate plates, one for each patient, and if made dishes can be put into small separate pie-dishes so much the better. Finally, the food must be served with an eye for each patient's likes and dislikes; and this is the special province of the ward sister. If the patient in bed 5 is a clerk, perhaps rather fussy about his food, then she must be fussy too. If his neighbour in bed 6 is a hungry navvy, he must have the loaded plate his stomach craves. To most patients however, it is better to give a little, neatly served, and to make sure that they are offered second helpings. A nurse can take the trolley round and offer more to every patient, with a little personal encouragement for each.

Besides being pleasant to look at, food described as hot must be hot, and food described as cold must be cold. Tepid dishes have had no success in tempting the appetite of the sick.

CANADA

FROM OUR OWN CORRESPONDENT

IN considering applications for certification as specialists, the Royal College of Physicians and Surgeons of Canada has displayed a lenient attitude towards senior men who have be[illegible] but who have not acquired spe[illegible] less ready to register without [illegible] applicants who are within a few years of graduation. Examining boards are not yet set up but it will not be long before they are established. The time has come to insist that the would-be specialist has taken pains to acquire a special skill.

The fellowship itself should be the best evidence of proficiency in general surgery, medicine, or obstetrics. At the recent annual meeting 10 fellowships were awarded [illegible] the final examinations [illegible] on passing the regular [illegible] vigorous growth that [illegible] obtained [illegible] for any y[illegible] increasing[illegible] it might be expected that the fellowship would be a coveted reward.

In England Now

A Running Commentary by Peripatetic Correspondents

ON returning to the tropics after an interval of eight years, I was surprised at the change in the attitude of most Europeans to the sun. Formerly in Central and East Africa it was generally believed that to go out of doors without a topee before 4 PM—even on a cool or pouring wet day—was to court sudden death or at least serious mental derangement. Topees were also de rigueur inside tents, cars, and even buildings of insufficiently robust construction. The danger was thought to be not from heat but from some special "rays" only found in the tropics. Some few people, medical officers and others, questioned this view, but they were looked on as dangerous revolutionaries. There was indeed one senior official who had carried out his duties for many years with unusual drive and efficiency but seldom wore a hat, and he was sometimes cited by the newcomer in disproof of [illegible] defeat the old s[illegible] *seemed* quite l[illegible] When asked in[illegible] themselves (for Dr. A. seemed to be the sanest of men) the old stager would say: "He does all sorts of queer things—for instance, he goes out without a topee." Nowadays it is comparatively rare to see a topee being worn by a European, this type of headgear being almost entirely restricted to native clerks. Nevertheless the general health of European residents and of troops is probably better than ever before. The newcomer to the tropics is well advised to treat the sun with reasonable respect, but the *difference between the radiation in tropical and temperate regions is clearly quantitative and not qualitative.*

* * *

Another examination has come and gone, and as an examiner my first reaction is one of sympathy for the London student and his teachers. I surmise that work has been much disturbed by the flying bombs, and that clinical material is still appreciably restricted. Moreover, clinical teachers all over the country are tired and overworked, and steady leisurely teaching must be almost impossible. All too often the Finals candidate is at sea about fundamentals. Observation of simple clinical happenings is surprisingly at fault; the alæ nasi of the bronchopneumonic child are not noticed, Cheyne-Stokes breathing goes unrecognised, the heaving pulsation of an obvious aneurysm is not felt by the palpating hand. Cardiac murmurs are not timed, or if they are timed, more often than not they are wrongly and indeed impossibly placed. Physical signs in the chest are more than ever a mystery. As a result many Final MB candidates show themselves little less immature than students doing their terms of clinical clerking.

The vast majority of candidates seem never to carry out for themselves any clinic-room investigations. Practical familiarity with urine testing hardly exists. No doubt the sending of specimens to the clinical laboratory for report has relieved the student of any feeling of responsibility for making investigations of his own. "The presence of pus is made more [illegible]" wrote one candidate in answer to a question [illegible] white-cell count, "*by the return* (my italics) [illegible] count of 25,000." This student is evident[illegible] of ever doing his own blood [illegible]

One of my [illegible] commented on t[illegible] are some mistakes which I [illegible] tubucolosis, classiffication, [illegible] dillusional, vommiting, [illegible] dirty hurd of cows"; "[illegible] through the intestinal [illegible] (where presumably [illegible] notice a surprising [illegible] even to the exten[illegible] D for "diag[illegible] that even thou[illegible] poor ignor[illegible] interpret [illegible] stump[illegible] ordit[illegible] app[illegible] acute cholecystitis, there may be pain": "prolonged boiling of milk tends to destroy vitamin C": "acute bacillary dysentery may be accompanied by diarrhœa."

One or two outstanding delights were noted. Discussing the diagnosis between the coma of drunkenness and that due to illness, one candidate wrote "The breath may smell of stale alcohol. A smell of fresh alcohol may indicate that the man may have felt ill before becoming unconscious, and took a little alcohol beforehand"—a useful fellow, this, for a police surgeon's job. Another suggested that "the patient must be red-educated" ("in Moscow, I presume," commented my co-examiner). "The large cyst," wrote another, "forms many daughter tæniæ which are called scolioses." One student thought that dogs deposited ova of *T. echinococcus* via the urine on to lamp-posts, from which the human being got his infection.

In the clinical part of the examination, many students are like those witnesses in court who have a story to tell and who are determined to tell it in all its details and irrelevancies. They waste precious minutes of the all-too-short time which the examiner wishes to use for finding out what the student knows and so help him to get through to qualification. "Just give me the salient facts about this patient, and don't worry about the things that do not matter," says the examiner: but the candidate pores over his little sheet of notes and explains that the patient has yellow hair, lives at Putney, does her washing on Tuesdays because her daughter from Twickenham leaves the baby with her on Mondays, and seven years ago scratched her right arm when she was blackberrying in the country. You understand this urge to get the story right in every detail, and you sympathise: nevertheless, you wonder whether your examinee can assess the important facts in the history and in the examination of the patient

To those who have anything to do with the preparation of the student for his Final, I would give this advice:

(1) For some weeks before the examination, take him often to the bedside and make sure that he can observe and examine a patient. Students do not fail because they cannot localise a cerebral tumour or detect the passing of a benign hypertension into the malignant hypertensive phase. They come down because they miss a gross falling in of one side of the chest or a dextrocardia due to fibrosis of the lung; because they cannot detect an obviously enlarged liver or spleen, or time an easy cardiac murmur, or feel a well-marked collapsing pulse. A student who shows that he understands the significance of the history and symptoms of the case and can elicit correctly the physical signs is likely to do well even when he fails to make a clear-cut diagnosis.

(2) Make sure that the student has practical experience of the usual side-room investigations. The examiner in a qualifying examination is much more interested in whether the student has a working knowledge of albuminuria or glycosuria, whether he is aware of the practical snags which may arise, than in what he knows theoretically about the van den Bergh reaction or the electroencephalogram. He feels that the student ought to be familiar with the appearances of sputum in the sputum cup, or with elementary observations and tests on the fæces.

(3) Reassure the student that examiners are cheered up when they meet any evidences of "clinical nous"—for example, if in discussing a patient the candidate picks out the four or five salient points in the history, or links up the absence of a presystolic murmur with auricular fibrillation.

* * *

Pongo-Pongo is not the only place demanding intermittent or preferably regular indulgence in alcohol for the maintenance of reasonable health and a temper of workable equability. The steamy heat of Beira in Portuguese East Africa requires a litre or two of light Danish lager at midday and some five or six double whiskies after sundown. When I was there I asked a Portuguese colleague why this should be so. He was a brilliant if daring surgeon who once excised a kidney on board ship with no more tools than the ship's butcher could provide. Years later, to his extreme surprise, he met his patient sturdily tramping the streets of Capetown. On this alcohol question he agreed there was no special nutritive or medicinal quality in alcohol likely to account for the facts. He thought its effect on the mind was the important factor. "We live here in a little [illegible] he explained. "we meet the same few people and see the same faces every day and we are bored. The night dose of alcohol releases the inhibitions just enough to make us pleasant company and so helps to maintain a good mental tone. Nothing encourages the invading germ like low mental tone." Our discussion took place over a glass after the funeral of the manager of a local shipping firm. The firm's proprietor was a staunch teetotaller and insisted that his managers should be teetotallers too. His Beira branch—the only one in the tropics—had the reputation of being the unluckiest branch in the firm. "In this country," said my Portuguese friend, "teetotallers die first and drunkards next, but the moderate drinker often lives to a good age."

On Active Service

CASUALTIES

DIED OF WOUNDS

Captain ANTHONY DESMOND FISK, MB CAMB., RAMC

WOUNDED

Captain J. H. BENNETT, RAMC
Lieutenant R. BRIGGS, RAMC
Captain N. G. D. CAMPBELL, BM OXFD, RAMC
Captain S. M. P. CONWAY, MC, LRCPI, RAMC
Captain J. C. F. CREGAN, MRCS, RAMC
Captain N. C. ROGERS, MB LOND, RAMC
Captain J. SCOTT, RAMC

DIED

Major BARNETT FREEDMAN, MRCS, RAMC

AWARDS

MENTION IN DESPATCHES

[illegible] been mentioned in recognition [illegible] in Italy:

[illegible] G. Morgan, OBE.

Colonels.—C. B. C. Anderson, OBE, A. Angus, J. T. McOuat, OBE, R. M. Savege, OBE, MC, C. H. K. Smith, OBE, MC, J. R. N. Warburton, MC, G. G. Drummond.

Lieut.-Colonels.—J. H. Ward, DSO, MC, W. A. Ball, W. S. Brindle, H. A Brittain, J. D. Easton, OBE, W. Graham, L. J. Haydon, L. G. Irvine, D. MacD. Lyon, D. M. Mitchell, W. Patrick, G. W. Molyneux, E. F. S. Morrison, MC, J. J. O'Connell, OBE, J. Pyle, MC, J. H. Sangster, A. Wilcox, P. H. Wood, N. G. G. Talbot.

Majors—S. S. Chesser, S. Alstead, A. H. Baker, E. L. Carter, F. A. Denz, J. F. Ford, E. M. Griffin. W. F. Hamilton, W. A. Heggie, MC, C. C. Hurst, D. B. Jagger, D. Jefferiss, R. C. Little, J. C. MacKillop, *B. J. Malley, D. Matheson, J. M. McKiddie, J. D. N. Nabarro,* A. I. Ross, H. M. D. Shepherd, N. J. Y. Simpson, A. Stuart, H. Waters, W. R. West-Watson, MBE, J. H. Whittles, E. G. Wright

Captains.—H. Auger, E. Batley, O. H. Belam, C. Cameron, J. W. M. Christie, T. B. Davidson, K. B. Dawson, D. C. Devine, G. F. Edwards, MBE, J. T. A. Essex, C. Giles, S. J. G. Gilmour, R. T. Grime, A. Henderson, A. W. F. Heron. E. W. Lindeck J. G. Macarthur, MC, D. Macdonald, J. McLean, L. F. McWilliams, F. E. Milson, A. E. Rampling, E. M. Sewell, J. M. M. Steven, M. G. Sutton, R. T. B. Watson, C. W. M. Whitty, M. Wirtheim.

Lieutenants.—C. Croffield, F. B. Lee, R. C. Medland.

MEMOIR

Captain F. MURRAY WAINMAN was killed by enemy air action near Falaise in Normandy during August. Born in 1916, the younger son of Mr. F. J. Wainman of Glasgow, he was educated at Glasgow High School and University, graduating in science in 1936 and in medicine three years later. After six months as house-surgeon at Glasgow Royal Infirmary he joined the RAMC in 1940, and a year later was posted to Egypt. He served with the Eighth Army in North Africa and in Italy until the end of 1943. Tall and well built, Murray Wainman's quiet unassuming manner, hid an adventurous spirit. Essentially a man of action, he was posted at his own request to an armoured regiment soon after he joined up, and he earned the admiration of his men and unit by his coolness and daring while attending the wounded under fire. As a boy and as a student he was keen on yachting and rugby football, and after leaving school he played for Glasgow High School FPs.

Yorkshire Pct

"... So long as we permit the sale of combinations containing anywhere from 7 to 10 different vitamins and 5 to 8 different minerals in a single pill, with the hope that something in the mixture will hit something that the patient has, we are getting farther and farther away from scientific medicine."—Dr. MORRIS FISHBEIN, *J. Amer. med. Ass.* 1944, **126**, 759.

Public Health

SOME OBSERVATIONS ON SCABIES AND ITS TREATMENT

HORACE A. NATHAN, MRCS, DPH
MEDICAL OFFICER, EPSOM AND EWELL BOROUGH COUNCIL

SCABIES is often regarded as a war disease. But for
sor
Mc
to .

AGE-DISTRIBUTION AND SYMPTOMS

Two scabies clinics were set up in Epsom and Ewell in 1942.

At clinic A 516 cases (178 males and 338 females) were treated in the year ending Aug. 7, 1943. At clinic B 294 cases (105 males and 189 females) were treated in the year ending Sept. 22, 1943. The charts classify the cases by age and sex.

The preponderance of females is striking. At the higher ages this might be explained by war conditions, and the closer association of females with young children in the home. At the lower ages, the sex difference is much smaller, but the figures do not justify any general conclusion.

The impression I have formed is that infection takes place among school-children, who carry it home to their families. In the last war men used to contract the condition in the trenches and then take it home; but now the father is infected on leave. Some authorities have shown that the disease is often of venereal origin, but there is no evidence of this in the series of cases described here. Eruptions on the thighs and external genitalia

, in general practice,

burrows or vesicles, but with o
spots—which cause great irrit
the presence of the sarcoptes.
of the fingers and toes seem to
has no particular distribution. Moreover, the periods of
or winter
term the
ldren are
n. Many

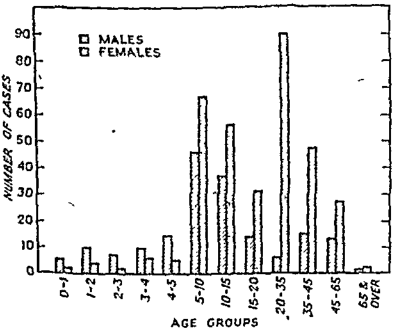

Fig 1—Cases treated (clinic A).

of these small patients show few signs—perhaps only a grimy burrow—in the web of a finger or at the wrist. Others

abdomen is a common site for scratched and un-
the folds of the axilla,
spots, no special part of
y defined as a diagnostic

The detection of the disease has become more difficult, and all types of skin lesion, including impetigo, are suspect. All cases must be carefully examined, and one is sometimes fortunate in tracking down an odd burrow,

treatment.

DIAGNOSIS AND TREATMENT

In doubtful cases itch mites are sought with the point of a needle. The mites are then examined microscopically: the suspected speck is mounted on a slide with a drop of 'Lactophenol' (BDH 20% phenol) and the mites seem to swell up and show clearly.

All patients are bathed with hot water, and carbolic soap is liberally applied. They are thoroughly dried, are painted with a preparation of benzyl benzoate emulsion made up with 'Lanette' wax SX (Mellanby and Johnson 1942), and are given *clean underclothing. After 48 hours they are* again bathed and repainted; again clean underwear is put on, and they are told to apply, night and morning, a powder consisting of equal parts of zinc oxide, starch, and boracic acid. Powdering is continued for a week, after which they are inspected by the medical officer; the lesions are then found to be quite pink, and in another week they become small brown scabs which dry and fall off.

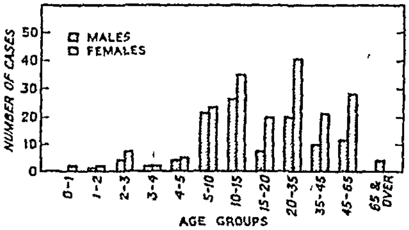

Fig 2—Cases treated (clinic B).

No patient in this series has developed dermatitis while receiving benzyl benzoate treatment only. Two did complain of smarting thigh rashes but they had been treated elsewhere with sulphur. After their second treatment, on the lines set out above, they cleared up without further trouble.

FOMITES AND REINFECTION

The Ministry of Health Memorandum (1940, 1942) did not recommend the disinfection of clothing, although MacCormac (1943) considers that infection may be derived from blankets and bedding. In the routine of
wash their under-
hich is distributed
The blankets are
aired by hanging them up for a whole day in the patient's garden or backyard. In a few cases where reinfection occurred patients
weeks later, were
ready so that t
disinfested.

Reinfection was often traced to refusal of treatment by one member of a family because he was not yet suffering from skin irritation; when his itch mites had incubated, he reinfested the rest of his household. It was seldom necessary to treat a person a third time in order to clear up skin eruptions; only half a dozen cases in the whole

found successful, even without the washing in hot water. Treatment by one application, as recommended by Graham (1943), did not clear cases satisfactorily; indeed, itch mites isolated after treatment were found to be alive and therefore capable of reproduction.

ADMINISTRATION OF CLINICS

Clinics are held daily and all contacts are treated whether showing eruptions or not. Anyone complaining of irritation at night is presumed to need treatment.

A special register is kept of the name, address, age, occupation, and dates of treatments given to patients, inspections being noted in a special column. Reinfections are filled in with red ink. The environment of each reinfected patient is carefully investigated. A consent form must be signed by the patient or (if he is under 16) by the parent or guardian. All particulars are copied on a card (following the routine practice used for infectious fevers), and sanitary inspectors are instructed to call at the patient's house to make all necessary inquiries. Should patients not arrive for treatment regularly, or should the contacts fail to appear, the sanitary inspector or health visitor is instructed to follow up by further visits. It has never been found necessary to compel treatment by invoking the Scabies Order, 1941.

Some of the views in this paper may differ from those now current; but they are based on the observations made in this limited survey. On examining further cases and figures for the months following those covered here, I found no reason to vary my conclusions.

SUMMARY

Experience at two scabies clinics suggests that the disease has changed its type in the last few years, making diagnosis more difficult, and that it has become more prevalent among school-children.

Females, especially adults, are possibly more susceptible to infection than males. In this series there were many more females, especially in the age-groups 15–20, 20–25, and 35–45 years. Among school-children in the age-groups 5–10 years and 10–15 years, girls preponderated.

No cases of dermatitis have developed in this series after benzyl benzoate treatment.

I wish to express my thanks to Dr. Cyrus Ive, MOH for Epsom and Ewell, for permission to publish this paper, and to Sir Arthur MacNalty for his helpful suggestions.

REFERENCES

Graham, J. R. (1943) *Brit. med. J.* i, 413.
MacCormac, H. (1943) *Ibid*, ii, 667.
Mellanby, K., Johnson, C. G. (1942) *Ibid*, ii, 1.
Ministry of Health (1940) memo 229, revised 1942.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED JAN. 6

Notifications.—The following cases of infectious disease were *notified during the week: smallpox, 0; scarlet fever,* 1462: whooping-cough, 1538; diphtheria, 439; paratyphoid. 1; typhoid, 8; measles (excluding rubella), 11,947; pneumonia (primary or influenzal), 1242; puerperal pyrexia, 124; cerebrospinal fever, 49; poliomyelitis, 3; polio-encephalitis, 2; encephalitis lethargica, 0; dysentery, 204; *ophthalmia neonatorum*, 63. No case of cholera, plague, or typhus fever was notified during the week.

[illegible] l civilian sick in the Infectious Hospitals [illegible]ncil on Jan. 3 was 961. During the [illegible] cases were admitted: scarlet fever, 53; [illegible]; whooping-cough, 24.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 13 (0) from measles, 15 (0) from whooping-cough. 14 (0) from diphtheria, 41 (6) from diarrhœa and enteritis under two years, and 55 (9) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 4 fatal cases of whooping-cough. Liverpool and Leicester each had 4 deaths from influenza.

The number of stillbirths notified during the week was 224 (corresponding to a rate of 28 per thousand total births), including 20 in London.

Ella Sachs Plotz Foundation.—During the 21st year of this foundation for the advancement of scientific investigation 27 applications for grants were received, of which 19 came from the United States and 8 from five different countries in Europe, Asia, and South America. The total number of grants made during the year was 18. Grants are made to researches in medicine and surgery. They may be used for the purchase of apparatus and supplies needed for special investigations, and for the payment of unusual expenses incident to such investigations, including technical assistance, but not for providing apparatus or materials which are ordinarily a part of laboratory equipment. Stipends for the support of investigators are granted only under exceptional circumstances. The maximum grants will usually be less than $500, and applications for the year 1945–46 should be sent before April, 1945, to Dr. Joseph C. Aub, Massachusetts General Hospital, Fruit Street, Boston, Mass., USA.

Letters to the Editor

WHO SHOULD FEED THE SICK?

Sir,—In your leading article of Jan. 6 you assert that "improper social distinctions have crept into hospital feeding," that "officers may have good food at the expense of other ranks . . . who do not always get enough," and that "'surplus' rations from the public wards may be used to make sweets and [illegible] patients' supper." As these [illegible] have already been quoted in [illegible] seriously calculated to promote social discontent, it would be interesting to know on what evidence they are founded.

Streatley, Berks. **Robert Hutchison.**

*** "Full diet" patients in general wards do not always receive their full ration: thus in three hospitals mentioned in the King's Fund report the fat issued daily averaged 45, 35, and 47 g. instead of 77 g. In some hospitals jam, marmalade, butter, and bacon seldom or never appear in the public wards, but are regularly given to private patients and officers. Competent observers have no doubt that abundance in one part of the hospital is sometimes related to scarcity in the other part. Our own purpose will be served if our readers make certain that these "grave charges" cannot be sustained against the hospitals with which they are connected.—Ed. L.

TREATMENT OF DIPHTHERIA

Sir,—I desire *not to fan but rather to quench* the embers of this old controversy about the dosage, and methods of dosage, of diphtheria antitoxin. "Dosage," wrote Claude Ker long ago, "must be decided by observation of results in actual cases, and these results, after all, in spite of statistics, must be a matter of personal opinion." Since it is the basis of the free practice of medicine, this is a view with which no clinician will quarrel. Nevertheless, personal opinions may be modified, as the years pass, as the result. for example, of improvement in the therapeutic weapons provided by laboratory [illegible] or the laying by them of old bogies. [illegible] opinion, already expressed here and there, in print, is that it is rarely necessary to exceed a single dose of 50,000 units of antitoxin provided part or whole of the dose is injected intravenously. I thus agree substantially with the suggestion in your leading article. I must add that my opinion as to the upward limit of dosage has been influenced by personal clinical observations during the last few years of the progress of patients treated with the current disaggregated (enzyme-digested) sera to which I refer again below. Much of the controversy turns upon the importance to be attached by the clinician to "avidity."

Glenny and Barr[1] point out that "it was suggested as early as 1900 by Roux and in 1904 by Cruveilhier that the curative power of a diphtheria antitoxic serum (DAS) was not solely dependent upon its antitoxic value." There was not only a quantitative but a qualitative value and "the term 'avidity' was introduced by Kraus" to indicate "firmness of combination with toxin." *Individual* samples of DAS vary in avidity. Some combine loosely with toxin "forming complexes which dissociate considerably on dilution" (Glenny, Pope, and Waddington[2]). Methods were devised by Madsen and his co-workers and by Ramon by which the properties of samples of DAS might be compared. Into the details of these methods it is unnecessary to enter; they are outside the province of the clinician who only needs to know (what, apparently, some do not) that "batches of antitoxin prepared for clinical use are blends obtained from a number of different horses" and "that such blends make it probable that the avidity has little practical importance" and "is of no importance at all if each constituent of the mixture has a correct in-vivo/in-vitro ratio" (Glenny and Llewellyn Jones[3]). If, for clinical purposes, avidity can be discounted, so also, logically, can "intensive therapy" in the sense of repeated doses. An additional dose rather than repeated doses on the instalment system is called for when it has become clinically manifes

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1. Glenny, A. T., Barr, M. *J. Path Bact.* 1932, 35, 91.
2. Glenny, A. T., Pope, C. G., Waddington, M. *Ibid*, 1925, 28, 27
3. Glenny, A. T., Llewellyn-Jones, M. *Ibid*, 1931. 34, 110.

that the first dose was under-assessed, and—since time is vital in the treatment of diphtheria—it should be given intravenously, especially if the first injection was intramuscular. On the other hand, it is often not realised that choice of the intramuscular route implies recognition of the fact that no *effective* concentration of antitoxin in the blood-stream will occur for many hours. How often has one seen the premature injection of a second dose of antitoxin by the intramuscular route six or eight hours after the first because no obvious clinical improvement was manifest after this short interval! However, as Osler wrote, "the danger is in giving too small and not too large a dose."

So far, your correspondents have not referred to what I consider to be an outstanding achievement in the preparation of DAS which has not only laid the bogy of serum reactions but has also in my opinion justified the employment of smaller doses than were called for in the days of the older salt-precipitated products. The disaggregated sera of Pope[4] [5] have been used in my [illegible] since their introduction. I am satisfied that this [illegible] has, apart from its freedom from foreign [illegible] the other advantages in the clinical field [illegible] shown to possess in laboratory trials by [illegible] Llewellyn-Jones[6]; inter alia, it is "ab[illegible] rapidly and eliminated more slowly" than salt-precipitated DAS. Hence in large part is due my agreement with the opinion expressed in your leading article.

London, N15. E. H. R. HARRIES.

AMŒBIASIS

SIR,—Dr. J. Graham Willmore is in error in attributing to me the conception or the use of the appellation "Liverpool" treatment for amœbiasis. I myself have never employed this designation, which I heard for the first time at the discussion on amœbiasis at the Royal Society of Tropical Medicine. I there understood it to refer to one course of "combined" treatment employed here for many years, the details of which I supplied, at their request, to the Service authorities who wished to try it out in conjunction with other courses of treatment for chronic amœbiasis. This particular course was elaborated [illegible]
and my [illegible]
founded [illegible]
1926. [illegible]
in minor resp[illegible] Dr.
Willmore, as [illegible]veral
such "combi[illegible] used
[illegible]

Liverpool School of Tropical Medicine. A. R. D. ADAMS.

DEATH AFTER INTRAVENOUS NEPTAL

S[illegible]
of [illegible]
Jan[illegible]
drug, the number of toxic manifestations reported is extremely small, but I wonder whether severe and sometimes fatal reactions are not occurring with greater frequency than is commonly assumed.

During the last three years I have witnessed 4 deaths after the intravenous injection of two c.cm. of neptal and 3 severe general reactions from which the patients recovered. The patients were all suffering from congestive heart-failure with marked œdema and effusions into the serous cavities. The clinical picture resembled that described by Dr. Rennie. One to three minutes after the injection the patients became distressed and dyspnœic. They lost consciousness and looked pale, cyanosed, and shocked. Distension of the cervical veins was noticed. There were a few convulsive movements, the pulse became imperceptible, and the patients died about five minutes after the injections. In the less severe reactions the patients made a complete recovery. An autopsy was done in 3 cases. They all showed well-marked engorgement of the right side of the heart with distension of [illegible] congested. The kidneys in 2 patients were abnormal. In the first they were small and contracted, typical of chronic nephritis. In the second they showed evidence of acute glomerular nephritis—the œdema which had been thought to be due to chronic rheumatic heart disease had been of renal origin. Two of the patients had had no previous injection of neptal, so acquired sensitivity to mercury is unlikely to be the cause of these severe reactions. The clinical picture is very much like that observed in anaphylactic shock. Neptal may further damage abnormal renal tubules and lead to the sudden setting free of a histamine-like H-substance which will cause the unexpected death.

Essex County Hospital, Wanstead. E. FRANKEL.

TRACHOMA AND SULPHONAMIDES

SIR,—In his letter in your issue of Dec. 30, Major MacCallan expressed the view that sulphonamide medication is ineffective against the virus of trachoma. During the past 6 years I have used sulphonamides extensively, both internally and by local application, in the treatment of trachoma. Internally the amount given was ⅓ grain of sulphanilamide per lb. body-weight during the 24 hours. This dosage was continued for 14 days, and for a further 14 days half the amount was administered daily. I am in complete agreement with Major MacCallan that sulphonamides have no effect on the virus of trachoma. In my opinion it is their beneficial effect on the secondary [illegible]
with trachoma which has l[illegible]
that a curative effect has [illegible]
trachoma itself. Dramatic [illegible]
symptoms due to a seconda[illegible]
phobia, can be produced. [illegible]
have continued to use sulphonamides, but while doing so I have come to realise that they were having no effect on the trachoma per se. In order to prove that the sulphonamides were effective against the virus of trachoma it would be necessary first to discover the presence of inclusion bodies in particular cases, and then demonstrate their disappearance after a course of sulphonamide therapy.

Dublin. F. S. LAVERY.

IN WHICH WE MIGHT SERVE

SIR,—Dr. Batten's point that the Board of Admiralty has powers far exceeding those of the proposed Central Health Services Council may well be true; but Admiral of the Fleet Lord Chatfield has given his considered opinion that the Board of Admiralty, lacking as it does the right to present its advice direct to Parliament, has been powerless to warn the public of the appalling danger in which it stood from 1932 to 1939. He advocates the setting up of a Defence Committee with direct access to Parliament. If politicians have shown such irresponsibility in the past in the life-or-death matter of national defence, it would hardly seem prudent for the medical profession to submit itself to a politician—that is to the Minister of Health—without the safeguard of an advisory committee having the right of publishing its report to Parliament year by year.

Bridlington. P. D. H. CHAPMAN.

MEDICAL FILMS

SIR,—Your readers interested in rabies may like to be reminded that there is a film containing a case-illustration of a boy affected with this disease. It shows well the apprehensive facies, the clarity of mind, the reluctance to drink, and the spasm of face and neck muscles. The film may be hired from the Kodak Medical Film Library, Kingsway, London (16 mm. silent). We would like to [illegible] (or in Britain) [illegible]

In the review of Russian films (Jan. 13, p. 60) you talk of the picture "jigging about the screen all the time." This defect may arise in a variety of ways. If the camera is unsteady [illegible]
if it is held [illegible]
movement o[illegible]
slow one, ar[illegible]
"weaving." But if the pull-down mechanism in the camera, or more rarely in the printer, is worn, the movement of the picture on the screen will be a quick one,

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4. Pope, C. G. [illegible]
5. Pope, C. G. [illegible]
6. Glenny, A. T. [illegible]

and up-and-down only; this is known as "jittering." If these defects are present on the original record nothing can be done to improve them, but if only on the release print a new print can be made which will remain steady on the screen.

S. J. REYNOLDS,
Hon. Sec., Medical Standing Committee,
London, SW7. Scientific Film Association.

THE TYPHOID-SALMONELLA GROUP

SIR,—In your issue of Dec. 30 Capt. J. F. Goodall reports a case in which a primarily inagglutinable strain of *Bact. typhosum* was obtained by blood-culture from a very ill patient. Such cases are not very rare. The atypical behaviour is not always due to a Vi antigen, but may be attributed to some—so far unidentified—protective covering developed by typhoid bacilli, and perhaps other organisms, in the human blood-stream.

Many years ago I isolated an organism giving cultural reactions of *Bact. typhosum* from the blood of a patient with symptoms resembling enteric fever. This organism agglutinated to titre with BW & Co. antiserum but not with MRC serum from the Oxford laboratory. A sealed agar slope of the organism, with a bottle of the erring serum, was sent to Prof. A. D. Gardner, who reported that by the time they reached him (some six weeks in transit) the organism agglutinated perfectly with the serum. This was before the Vi materials became generally available. Several other strains with aberrant behaviour were isolated—always from blood-cultures—and all "came into the fold" after prolonged subculture. (We used to call these strains *B. assidi* after the laboratory assistant, Ali Hassan Assidi, who made the first isolation.)

Recently *B. assidi* again appeared in a blood-culture from a (clinically) typhoid patient. This strain gave the cultural reactions of *Bact. typhosum* but would not agglutinate with MRC or BW & Co. sera, nor with the serum of the patient. We tried the culture with Felix's antityphoid serum (Lister Institute), which is supposed to contain Vi agglutinin, and the blood of the patient with the Vi suspension supplied by the MRC, all results being negative.

This experience is worth recording since clinicians often try to "hustle" laboratory-workers with the object of provoking premature disclosures. In these atypical instances the laboratory-worker is within his right to refuse a definite opinion until the strain in question comes into line. This attitude often infuriates the clinician, but a suspension of judgment cannot be unknown in normal clinical practice, and "a fellow feeling" (all too rare) should make the impatient clinician "wondrous kind."

FRANK MARSH,
Pathologist, Anglo-Iranian Oil Co., Persia.

Obituary

WALTER ESSEX WYNTER

MD LOND., FRCP, FRCS

DR. W. ESSEX WYNTER, consulting physician to the Middlesex Hospital, died at Newbury on Jan. 4, in his 85th year. Unusually gifted, but lacking in ambition, he early gave up his practice and hospital appointments in London to spend a happy and active retirement at Bartholomew Manor, his 14th century home, where he grew his own tobacco and brewed his own mead. Here he and his wife spent skill and time on the intelligent repair of the manor and its cottages, some of which soon became the homes of retired Middlesex nurses. And in 1926 with discriminating generosity Dr. Wynter offered the manor itself, with an endowment for its upkeep, on the death of his wife and himself, to the hospital for the same kindly purpose.

The son of Andrew Wynter, MD, who practised in Chiswick, Walter Essex was educated at Epsom College and at the Middlesex and St. Bartholomew's Hospitals. He qualified in 1885, and when he took his MB with honours in 1887 he had already been a fellow of the Royal College of Surgeons for two years. He was elected FRCP in 1897 after he had already been for some years physician to the Middlesex Hospital and lecturer in medicine in the medical school. Though at heart a physician, and a physician with a flair for diagnosis, his interest in surgery continued, fostered by his intimate friendship with Bland-Sutton, and he made a point whenever possible of watching the operations on his own patients. His surgical colleagues too found him ready with apt suggestions, which he himself rarely bothered to follow up. For instance he suggested lumbar puncture, on anatomical and physiological grounds, some time before Quincke's work made this a routine diagnostic and therapeutic measure. At the Royal Society of Medicine in 1914 he described the results of splenectomy in acholuric jaundice, an operation undertaken by Bland-Sutton at his suggestion. He wrote but little, his series on *Minor Medicine* which first appeared in the *Middlesex Hospital Gazette* was published as a book in 1907 and his *Manual of Clinical Pathology* in 1890. His disinclination for private practice was not due to indolence, for he was assiduous (though not always punctual) in his hospital attendance, and he carried his interest in his patients into retirement, where he gave generously of his counsel and time to his colleagues and to the Newbury and District Hospital.

"With Wynter's logical reflective mind," writes R. A. Y., "went a keen almost intuitive aptitude in the diagnosis of difficult medical problems. He had a most attractive gentle personality with a kindly sense of humour—which endeared him to his colleagues and to all the students and residents who worked with him. He ambled through life unhurried, unperturbed, and serenely absorbed in the enjoyment of his interests and his hobbies, among them fly-fishing of which he was an enthusiastic devotee. He certainly adopted Shakespeare's advice to 'fling away ambition'; perhaps that is why he was one of the happiest men I ever knew."

Dr. Wynter married Miss Ada Wills, of Bristol, who died in 1937.

JOSEPH GRIFFITHS

CMG, MD EDIN., M CHIR CAMB., FRCS, DPH

FROM 1887 until his death on Jan. 4 Dr. Griffiths spent his life in Cambridge. The son of a farmer at Ponthenry, Carmarthenshire, he was born in 1863. At Edinburgh, where he received his medical education, he was Murchison scholar and graduated with honours in 1885, taking his MD with gold medal five years later. He became assistant to the professor of pathology at [illegible] his first post at Cambridge was likewise [illegible] department. Soon however he was combining the appointment of pathologist to Addenbrooke's Hospital with that of assistant to the professor of surgery, Sir George Humphry, and in 1892 he joined the surgical staff of the hospital. When Humphry died Griffiths became university reader in surgery and examiner in surgery; but after seven years he resigned his readership because he thought the school should again have a surgical chair. "During this period," writes H. B. R., "he added a large number of patho[illegible] to the museum, especially bone pre[illegible] evolved, with the assistance of his laboratory assistant, Frederick Izzard, a method of maceration which produced beautifully white specimens of bone diseases which were the constant admiration of generations of surgical examiners. He also had a large private collection which he presented to the Royal College of Surgeons." He wrote chiefly on bone and joint injuries and on urogenital disorders, especially prostatic enlargement, and in 1895 he delivered the Hunterian lectures on the testis.

During the war of 1914–18 Griffiths commanded the 1st Eastern General Hospital, with the rank of colonel. This unit was mobilised at Cambridge the day after war was declared, and finally occupied open-air huts on the King's and Clare cricket-ground. "The open-air ward was Colonel Griffiths's own idea, and was thought by many to be too spartan; but it proved of undoubted benefit to the patients." For his war services he was appointed CMG in 1918.

As a young man Griffiths was a keen follower of hounds, and in later life his hobby was farming; he also took a keen interest in animal pathology. Besides his Addenbrooke's appointment, he was consulting surgeon to the Huntingdon County Hospital and the St. Leonard's Hospital, Sudbury.

THE LATE MR. WALTERS

Professor Rendle Short writes: The Bristol Royal
for many years been one of those happy
e the surgeons have been able to main-
friendly relations with one another, and this comfortable atmosphere has been largely due to the character and influence of C. F. Walters. Until the war came to upset the routine, it was the custom for all the surgeons to meet every Friday, with the residents and students, to give an opinion on four or five cases, shown either because they were of special interest, or because the diagnosis or treatment presented some problem. The junior surgeon gave his opinion first and the senior last. Walters was in his element on these occasions: always sound and sensible; never trying to score off his colleagues; always friendly and helpful.

The son of a chartered accountant he came to the Bristol Medical School in 1895, qualified in 1900, and was appointed assistant surgeon to the Royal Infirmary in 1909. He took a special interest in bladder and prostate cases, and as the assistant surgeon had very few beds and opportunities of clinical experience were limited, he made ingenious model bladders on which to practise cystoscopy. Always obliging, hard-working, and good-tempered, he was a most congenial colleague, and well liked by his patients. In 1916 he was sent to France, and became surgeon to a specially advanced casualty-clearing station for abdominal injuries on the Somme front, as near the firing line as possible, so that cases might be operated on without delay. The series of 500 emergency operations for abdominal wounds, described by Walters and his associates in 1917, was one of the largest and most successful treated during the war.

He married Gertrude Popham in 1905 and leaves a son and three daughters.

Births, Marriages, and Deaths

BIRTHS

ASHBY.—On Jan. 9, at Bolney, near Haywards Heath, the wife of Captain Michael G. Ashby, RAMC—a daughter.

BALL.—On Jan. 8, at Hunstanton, the wife of Major P. H. Ball,

wife of the late Captain A. D.

A. P. Goffe, of Deodar Road, Putney—a son.

GORDON.—On Jan. 10, at Walton-on-Thames, the wife of Surgeon
N—a daughter.

the wife of Dr. Douglas D. C.

ter, the wife of Colonel L. R. H.

Cornwall, the wife of Captain J. H. Lovack, RAMC—a daughter.

the wife of Captain I. D.

wife of Dr. Jack Minett,

Dr. Michael Wood—a son.

MARRIAGES

Poona, India, Robert
Margaret Eleanor Berry,

GASS—CHAPMAN.—On Jan. 6, at Pembury, Thomas Gass, captain
WAAF.

Cairo, Finlay
sby-Johnson.

Robert Evan
, CSP, MAOT.

DEATHS

BARLOW.—On Jan. 12, in London, Sir Thomas Barlow, Bt., KCVO, MD LOND., D SC, FRCP, FRS, aged 99.

BLATHWAYT.—On Jan. 10, at Bath, Arthur de Visme Blathwayt, MRCS.

homas Broatch, CBE,
urne, aged 82

a Douglas Cameron,
in the Ministry of Health.

CROMIE.—On Jan. 7 at Nailsea, Somerset, George Cromie, BA NZ, MB EDIN., aged 73.

HAWTHORNE.—On Jan. 10, in London, Jane Lorimer Hawthorne, MB GLASG., wife of Dr. C. O. Hawthorne

MATSON.—On Jan. 12, in Dublin, John Agar Matson, MD DUBL., FRCPI.

MENZIES.—On Jan. 12, at Radlett, William Francis Menzies, MD, B SC EDIN., FRCP, first medical superintendent of Cheddleton Hospital, Staffs, aged 81.

NICHOLSON.—On Jan.

PEDLEY.—On Jan. 9,
MRCS, DPH, deputy

WHITWELL.—On Jan.
MB EDIN., formerly
Hospital, Melton,

Notes and News

BRITISH ASSOCIATION

ON Jan. 12 and 14 the British Association held a conference on the place of science in industry. The conference was opened by Sir Richard Gregory, and at its four sessions the chair was taken by Mr. Ernest Bevin, Lord McGowan, Sir John Greenly, and Lord Woolton. The first three sessions were mainly concerned with industrial research and development, but the fourth, looking to the future, gave all its attention to what science might accomplish in the broad field of health. Lord Woolton, who opened this last discussion, spoke of the debt of gratitude which the Government owed

nutrition
ask of the
lance that
the nutrition of the people had actually improved during war-time. In the future, Lord Woolton said, the scientist must be given his chance, because the nation would be too poor to afford the extravagance of preventable ill health. He emphasised the need for spending a greater part of the national income on research than the present meagre 0·1 per cent., and urged that the State should take a full share in promoting fundamental research as well as applied science.

Mr. E. Carter dealt with the housing problem of the future, laying stress on the need for closer coöperation between the technical experts and those concerned with design and beauty. *The food policy of the future was seen by Sir Joseph* Barcroft as a unique opportunity for collaboration between agriculture, veterinary science, and the health organisation, but little real advance could be made until Britain's future policy in food production was known.

Dealing with the contribution of science to health, Prof. J. M. Mackintosh, FRCP, referred to the need for a wider distribution of public-utility services such as water and electricity. In all branches of preventive medicine there should be closer coöperation between medical and technical officers to serve the common purpose of human welfare.

Sir Lawrence Bragg, in summing up, suggested that the real question was what we as a nation wished science to accomplish. In the past a great deal of scientific effort had been misdirected or wasted because public authorities, industrialists, and other bodies responsible for the public welfare had failed to apply the findings of science to everyday problems of life and work.

NEEDS AND BENEFITS

COMMENTING on the Government's white-paper on National Insurance, the Charity Organisation Society expresses satisfaction that the plan follows in its general structure the proposals of the Beveridge report. It notes, however, that the Government have rejected the subsistence principle: benefits will not be related to scientific estimates of nutritional and welfare requirements, or to the general cost of living. While appreciating the reasons for these decisions, the society suggests that rates of benefit should be periodically reviewed by an independent board.

On children's allowances the society points out that payment in kind to children attending school would penalise those children who are unable to attend school, either because they are too young or because of sickness or any other cause, and the deprivation would fall on them at a time when presumably their needs would be greatest. The society therefore urges that children's allowances should be paid out of taxation at the rate of 8s. per week for each child after the first.

and fr
school.
A school meals service should be established *for all children*, but the meals should be paid for by the parent out of the children's allowance, in order that those children whose parents prefer them to return home for their dinners may not be penalised

NATIONAL WAR FORMULARY

SOME alterations and additions to the second edition of the National War Formulary, to conform with the Seventh Addendum to the British Pharmacopœia and with the present supply position, will come into force on Feb. 1. Of the additions the most important is "Cream of sulphanilamide and sulphathiazole" for burns. This cream takes some three hours to dispense, so it will be kept ready for use in 1 oz. tubes only. Since it falls in Schedule IV of the Poisons Regulations pre[illegible] supplied.

If prescriptions are not for 1 oz. or multiples of 1 oz. delay in supply will be inevitable. Similarly with sterile powder of sulphanilamide, prescribers are asked to order 5 g. or multiples of 5 g. to avoid delay and waste. There is a severe shortage of preparations made from ipecacuanha. Squill is the approved alternative, but senega is again being imported and ammonia and senega mixture has been added to the *NWF*. There is an acute shortage of colchicum and it will be long before supplies improve. When the galenicals of this drug are unobtainable, colchicine tablets may be ordered; but doctors should prescribe these in minimal quantities and only where colchicum therapy is essential.

NEW HEALTH SERVICE AND PHARMACISTS

LECTURING in Scotland last week on the National Health Service, Mr. H. N. LINSTEAD, MP, secretary of the Pharmaceutical Society, said that the chances of the Government's proposals being put into effect were substantial. But, at a guess, the new service would not be ready to operate before 1948 at the earliest. The type of health centre he himself advocated was that recommended in the Dawson report, where the patient was sent by the family doctor for further examination, for consultation with the specialist, and for minor surgery. The private consulting-room would remain the normal meeting place of doctor and patient. If (as he hoped) the scheme was to be universal, it would embrace more than twice the present number of National Health Insurance patients. The NHI service could not be adapted to supply even the minimum needs of another 20 million, or more, people, and a new organisation was required from the first. Clearly the 15,000 pharmacists at present providing the NHI service must be used, as well as the outpatient departments of hospitals and public dispensaries. From this group of existing units a good local pharmaceutical service could be built up, including a night and emergency service and arrangements for express delivery. The individual pharmacist could keep his place in the scheme by giving such a service as to put out of the question the spending of public money in providing municipal dispensaries. No new pharmacy, private or public, should be added to the local panel unless the local pharmacy board was satisfied that it was needed to complete the service. A first-class service, adequately remunerated, would result in a pharmaceutical profession satisfied because it would be able to devote the greater part of its energies to the calling for which it had been trained and qualified and registered.

University of London

Dr. L. S. Penrose has been appointed to the Galton chair of eugenics at University College. Mr. Claude-Remington, PH D, has been appointed to the university chair of chemical pathology at University College Hospital medical school.

University of Durham

At a congregation held on Dec. 22, the following degrees were conferred:

MD.—*Helen Ramsay.
MS.—E. J. Field, R. A. Fleming, *John Sumner, *H. K. Vernon.
MB, BS.—W. R. Argument, *J.
Abraham Bender, R. E. Blakey, A.
Elspeth M. C. Brown, Neil Cardoe, R.
W. H. B. Ellis, A. J. A. Ferguson, A.
Mary M. Harrison, J. D. Irving, Wilf
Muriel M. Lingwood, J. L. McConchie, Norah Martin, Peter Millvard, R. W. J. Naismith, E. M. Norman, G. E. Paget, R. M. S. Parker, Alan Pearson, Kenneth Pickworth, W. G. A. Riddle, R. K. Rowntree, Winifred H. Russell, Jane C. Salkeld, R. G. H. Salkeld, Viola E. Shafto, N. A. Sharples, S. G. Siddle, Emanuel Silver, J. E. Stobbs, W. E. Stuart, Elizabeth Troupe, Doreen M. Watson, J. P. Wedderburn, G. E. Welch, J. T. Wheldon, Jean G. Wight, Mary C. Winters, N. E. Wood, and N. A. Wynne.

* In absentia.

Royal Society of Medicine

At a meeting of the section of odontology on Monday, Jan. 22, at 4.30 PM, Mr. B. W. Fickling will speak on the prosthetic aspect of the buccal inlay operation and Squadron-Leader A. B. MacGregor on jaw injuries. At the section of medicine, on Jan. 23, at 4.30 PM, Brigadier Frank Howitt and Major-General Sir Guy Glover will open a discussion on the development of health in adolescents. On Jan. 25, at 5 PM, at the section of urology there is to be a discussion on sterility in the male, when Mr. Kenneth Walker will be the opening speaker. On Jan. 26 at 3 PM, at the section of epidemiology and State medicine, Brigadier Hamilton Fairley, FRS, will speak on medicine in jungle warfare. On the same day, at 4.30 PM, at the section of disease in children, Dr. J. D. Kershaw, Dr. Isobel Wright, and Prof. J. C. Spence will open a discussion on the school medical service—present and future.

Royal College of Surgeons of England

A meeting of the council was held on Jan. 11, with Sir Alfred Webb-Johnson, the president, in the chair. Arran ments were made for the delivery of professorial lectu on anatomy by Prof. A. J. E. Cave, and on physiolog by Prof. John Beattie. The first course will begin on Feb. 19. It was decided to confer the title of research associate of the Royal College of Surgeons of England from time to time, for outstanding assistance in the work of the museum. It was reported that Mr. D. E. Lea of the Strangeways Laboratory, Cambridge, had . Williams of the Middlesex H . Prophit student.

It was decided to recognise the posts of first and second house-surgeon at the Royal Northern Infirmary, Inverness, for the six months' surgical practice required of candidates for the final fellowship examination.

Diplomas of membership were granted to Flavia Z. L B James of Bristol and to H. B. Marsden of Manchester. The following diplomas were granted jointly with the Roy College of Physicians:

DPH.—P. S. Jaikaran, H. G. Williams.
DPM.—Paul Cassar, Louise F. W. Eickhoff, R. K. Freudenber G. W. Green, Daniel Jackson, P. D. Scott, L. M. Shorvon, G. D F Steele, Erich Wellisch.
DLO.—R. G. Boyd, A. S. Davidson, N. A. Punt, Geoffre Snowden, P. A. Thorpe.

Grant to London Voluntary Hospitals

The Nuffield Trust for the Special Areas has given an addi tional £75,000 to the King Edward's Hospital Fund to help the voluntary hospitals of London with post-war reconstruc tion.

Royal Sanitary Institute

A meeting will be held at the town hall, Sheffield, on Jan. 27, at 10.30 AM, when Dr. J. M. Kennedy will speak on the treatment of cerebrospinal fever.

National Hospital, Queen Square

The clinical demonstrations which take place at this hospital, Queen Square, London, WC1, on Saturday morning are reserved for Service men and those working for ex minations.

Association of Industrial Medical Officers

A meeting of the Scottish group of the association will be held on Wednesday, Jan. 24, at 3 PM, in the Institute of Hygiene, University of Glasgow, when Dr. H. M. Robert the chairman, will preside.

Association of Clinical Pathologists

A meeting is to be held on Friday and Saturday, Jan. and 27, at 9.30 AM, at the Westminster Hospital school medicine, Horseferry Road, London, SW1.

Medico-Legal Society

At a meeting to be held at 26, Portland Place, London, W on Thursday, Jan. 25, at 4.45 PM, Mr. Hugh Linstead, secretary of the Pharmaceutical Society of Great Britain will speak on the Pharmacy and Medicines Act, 1941, and the sale of proprietary medicines.

Civil Defence Awards

The MBE has been awarded to Dr. UNA MULVANY, in charge of a Southsea first-aid post, and to Dr. T. WOOD, officer in charge of a Watford mobile unit.

Dr. Mulvany has been on duty during every heavy raid an always been on her way to duty within seconds of the first bo falling, never waiting to be called. By her unfailing courage complete disregard of danger she has set a wonderful exam and her kindness and cheerfulness have given great comfort many. On one occasion whe ect bu worked her way through the who trapped in the cellar and adm Altho she must have known that there was imminent danger of the pl collapsing she remained with them for nearly two hours.

A flying-bomb damaged houses and people were trapped. Dur the early stages of the rescue work walls were still collapsing a fires were burning. Dr. Wood took risks on many occasion order to administer morphia to the injured trapped in the de His cheerful leadership and devoted service were an inspira to the other rescue workers, and his efforts not only contribut materially to the saving of life but were a real source of encourag ment to the trapped persons.

The fact that goods made of raw
to war conditions are advertised
as an indication that they are

HÆMOTHORAX

NOTES AND OBSERVATIONS

N. R. BARRETT, M CHIR CAMB., FRCS
SURGEON TO OUTPATIENTS AT ST. THOMAS'S HOSPITAL, LONDON;
SURGEON TO THE THORACIC SURGICAL UNIT AT A WAR HOSPITAL

HÆMOTHORAX comprehends the chief part of traumatic thoracic surgery, and its management is of prime importance for this reason. In the observations set out here no attempt will be made to cover every facet of the problem. They are based upon experiences gathered at the thoracic surgical unit of a war hospital, and also at a coastal hospital since D-day.

PATHOLOGY

When blood is liberated into the pleura a series of pathological changes are set in motion; these changes are fairly constant in evolution, but the time at which they occur varies from patient to patient.

Hæmothorax has three immediate harmful effects—blood loss, pleural irritation, and the development of a space-occupying lesion in the chest. The blood does [illegible] s which influence [illegible] t tends to remain [illegible] patient has been [illegible] on both surfaces of the pleura, and others float freely, like the tentacles of a sea-anemone, in the extravasated blood. In addition some black shiny clots form and gravitate to the bottom of the chest. While these changes are taking place a serous effusion is poured out from the walls of the space to mix with the blood already present. The fact that the contents of the pleural cavity are not merely defibrinated blood is proved by examination of the cells present, by serial estimations of the hæmoglobin, and by the clinical observation that anæmia is not as gross as it would be if the fluid were pure blood. In some cases the whole of the pleural contents are at [illegible] normality ca [illegible] occupied by [illegible] dhesions. M [illegible] retained fo [illegible] Pockets of [illegible] partitions of fibrin, and organisation of the material deposited on the surfaces of the pleura begins. This layer of [illegible]

of [illegible]

[illegible] half the cases of hæ [illegible] me measure of at [illegible] they refer to is not simple compression of the lung by fluid or blood filling up the pleural cavity, but a blockage of some part of the bronchial tree producing an airless segment which will not expand when the chest is aspirated. Atelectasis is said to explain the facts that many a hæmothorax cannot be aspirated completely without air replacement because the lung will not expand immediately, and secondly that the lung cannot be re-expanded by positive intrabronchial pressure. The explanation would fit the facts very well, but in my view it is not usually the true one. There is no doubt that ipsilateral and contralateral atelectasis is [illegible] common [illegible] and [illegible] as [illegible] lun [illegible]

of [illegible] *and the deep layer of this membrane is* [illegible] *replaced by fibrous tissue.* At first it is only a [illegible] metres thick, but even so it is strong enough [illegible] lung as though it were contained in a paper [illegible] time passes it becomes very dense and [illegible] *that fibroblasts appear early in the* [illegible] *is a cardinal point in the pathology of* [illegible] theory is not [illegible] of the "atelectasis theory" at the time when William Pasteur drew attention to this condition. My reason for [illegible]

Source of the bleeding.—It is still a matter of dispute as to whether the place from which the blood comes is generally situated in the lung or in the parietes. Both are possible sources, although the probability lies in one or the other direction under different circumstances. The following points are pertinent:

1. Though the lung is highly vascular, persistent bleeding from a wound is seldom apparent at operation; and it is therefore probable that bleeding from the lung is profuse, but short-lived. The mechanism by which hæmostasis is brought about is not certainly known, but low pressure in, and selective spasm of, the pulmonary vessels in the injured area, a tendency to atelectasis, and a high immobile diaphragm are all contributory factors. Bleeding from the lung probably accounts for those cases in which a hæmothorax developing quickly is equally quickly cured, without any tendency to recur, by one or two aspirations.

2. Persistent bleeding, whether serious or slight, is generally due to wounds which involve the chest wall or the diaphragm. The same is true in those cases where the bleeding comes on several days after the patient has been wounded.

3. When the right leaf of the diaphragm has been [illegible] a space between it and the liver in which blood [illegible] during inspiration the muscle contracts [illegible] compresses the blood which is squirted [illegible] pleural cavity through the traumatic [illegible] a relatively common, and often unsuspected, [illegible] thorax. Blood can also pass from the [illegible] pleura when the left cupola of the diaphragm [illegible] forated, but its transit is due, in [illegible] negative pressure in the pleural cavity.

4. The intercostal spaces are [illegible] areas," as far as hæmorrhage from [illegible] concerned, because the intercostal [illegible] the lower margin of their [illegible] reasons why this is not always [illegible] through an intercostal space [illegible] of the rib and its angle, [illegible] this point because the [illegible] the deep surface of the [illegible] the angle. Secondly [illegible] often quite large, [illegible] to its neighbours [illegible] dy. over an intercostal [illegible] done punctured, [illegible] case introduced into [illegible] to gain

5. A [illegible] and this in the chest [illegible] removed. internal [illegible] ter operation remains [illegible] few additional is [illegible]

[illegible] starts [illegible] *tinues slowly but* [illegible] *weeks.*—These are [illegible] ribs and the chest [illegible] nes from parietal [illegible] d aspirations may [illegible] of the fluid in [illegible] re liberally [illegible] ganisation [illegible]

[illegible] ould

Hæmothorax may, however, be indistinguishable clinically from atelectasis, and this is particularly the case if clot has been deposited at the bottom of the pleural cavity. Again, in a large proportion of penetrating wounds some air gains access to the pleural cavity at the time of the injury. In many the wound in the chest wall seals off spontaneously and the air is quickly absorbed, but in some the air is retained and mixes with the blood, producing bubbles and froth. If this state of affairs obtains the patient does not present "the well-recognised signs of a pleural effusion." Moreover, surgical emphysema is common in the first 48 hours after any penetrating wound of the chest; it may mask the signs of a pleural effusion.

The abnormal position of the apex-beat, and of the trachea in the suprasternal notch, are generally quoted as cardinal points in the diagnosis of [illegible]. I doubt the importance of both these [illegible] *displacement of the mediastinum, awa*[illegible] *the hæmothorax, as a late and indefinite sign.* A *massive* hæmothorax can produce displacement particularly if the patient be examined in the sitting position. The conditions which obtain in a recent hæmothorax are importantly different from those in an inflammatory pleural effusion which has resulted from a pathological process in the lung. When blood is suddenly poured out into a normal pleural cavity it is easily accommodated by a diminution in the size of the lung upon the affected side; the lung, being normal, simply retracts towards the hilum. This process goes on until several pints of blood have accumulated before the mediastinum is displaced, and the only circumstance in which an early shift is likely is when pre-existing pleural adhesions so limit the spread of the fluid in any direction that the intrapleural pressure is increased. Another point is that the hemithorax of an adult can contain at least 7–8 pints of blood. In the case of an effusion, developing as a complication of such a process as pneumonia, the ability of the fluid to spread in any direction is soon limited by protective adhesions and the natural elasticity of the lung is diminished by consolidation, œdema or congestion. With these points in mind I would postulate that if a *moderate* hæmothorax produces *early* displacement of the mediastinum the pleural cavity has probably been partially obliterated by previous adhesions. In one case, which came under my care, radiography during convalescence showed that the whole of the apical pleura had been obliterated over an old healed tuberculous lesion, and in this man early displacement of the apex-beat had been recorded on the field card.

The blood in an early hæmothorax is free to move about the pleural cavity (whether air be present as well or not) and the position it occupies is dictated simply by the position of the patient. The result is that *the early signs are those of shifting dullness,* and for this reason there is a tendency to underestimate the amount of bleeding which has taken place. If the front of the chest be examined, as the patient lies on his back, a resonant note and good breath-sounds can be heard, because the aerated lung is floated forwards upon the fluid in the paravertebral gutter. When the same man is examined in the sitting position the blood will have gravitated into the costophrenic sulcus, but much of it will be disposed right across the base of the chest, and in the interlobar fissures, and the more the patient leans forward the less dullness will be detected at the base. There is in fact no way of assessing how much blood is present in the pleural cavity in any given case. A hæmothorax which extends as high as the 6th rib posteriorly is often described as being "of moderate extent," but if the chest of such a patient be opened it is not unusual to find that it contains 2–3 pints of blood, and it is generally true to say that a great deal more fluid is present than one expects.

A pleuropericardial rub, which is difficult to distinguish clinically from a pericardial rub, is not uncommon. This finding is not of much clinical significance, and the fact that the condition clears up quickly with treatment is the best argument against its cause being pericar[illegible]. I have recently operated upon a [illegible] rub of this type, and after the clot had been [illegible] pleural cavity was able to convince [illegible] was no pericarditis.

The only X-ray examinations of any diagnostic value are those made with the patient in the sitting position. If he is lying flat, as is often the case, the films show the "typical ground glass appearance." Antero-posterior and lateral films taken with the arms elevated are necessary. The X-ray picture of a hæmothorax is not the same as the textbook picture of an empyema; that is, it does not cast a shadow which rises from a broad base upon the diaphragm and arches upwards in a curved line towards a point in the axilla. The opacity is dense and homogeneous; it fades out into the normal lung markings above, and except when a fluid level is present (due to the presence of air as well as of blood) it has no definite edge. This opacity is often diagnosed as being due to a pulmonary hæmatoma rather than a hæmothorax.

With the passage of time some measure of clotting develops in every hæmothorax and this favours loculation of the fluid into pockets. These pockets are well seen in lateral films and are particularly outlined in cases where infection with gas-forming organisms has occurred. Pockets of air or gas, together with strands of fibrin, can easily combine to produce an appearance which is almost identical with coils of intestine, and a diaphragmatic hernia may be suggested.

The earliest symptoms of a large hæmothorax are shock, pain and dyspnœa; *the condition may, however, exist without any of these.* The shock and the pain are exactly comparable to similar manifestations in the case of abdominal wounds. The former is often a sign of primary internal hæmorrhage, and a man can easily bleed to death into the pleural cavity without losing any blood upon the surface of the body. The pain, which can be very severe, is the same as that caused by the presence of fresh blood in the peritoneum. It is the pain of acute pleural irritation, and is distinct from that caused by the actual wound; it resembles the pain which follows the introduction of substances such as silver nitrate into the pleural cavity. The severity of the dyspnœa depends not only upon the actual reduction in available breathing alveoli, but also upon such things as pre-existing adhesions in the pleura, and fear. Most patients with chest wounds are frightened at first, and often they either "struggle for breath" or indulge in rapid shallow respirations, both of which militate against efficient breathing.

Although the temperature of a patient suffering from hæmothorax is generally below 101° F, it can rise to 103° F or more, in the early stages, without any infection being present. Pyrexia in patients suffering from hæmothorax does not always signify infection. But infection should be suspected whenever the temperature persists or fails to show a steady progressive decline towards resolution.

TREATMENT

> "The mere presence of a hæmothorax warrants neither operation nor aspiration."

Statements of this type have had the effect of convincing many people that active treatment is only necessary in extreme cases. This matter needs examination, for to neglect a hæmothorax is to court trouble.

It is probably true that in all penetrating wounds some blood is present in the pleural cavity, and that in many cases this is rapidly organised and removed without leaving any detectable abnormality of respiratory function. When this is taken in conjunction with the facts that, except in the case of rapid bleeding, hæmothorax does not constitute an obvious surgical emergency and that the patient appears to be in good condition, it is not surprising that general surgeons—who never seem to be quite happy when dealing with the thorax—are prone to adopt conservative treatment.

Now "conservative treatment" is a vague term. To some it implies that nothing, apart from the exhibition of sulphonamides and penicillin, should be done to a hæmothorax; to others it connotes a few spasmodic aspirations at convenient intervals; and to a few it means that frequent and regular aspirations should be carried out until the lung has fully expanded and the pleural cavity has become dry. Most thoracic surgeons favour the last of these interpretations, for they believe that *the basis of the treatment of all intrathoracic wounds* [illegible] *to secure total expansion of the lung at the earliest* [illegible] *moment.* Whichever view may be taken, I submit, that the following points should have been weighed in the balance:

1. A hæmothorax is not an ordinary hæmatoma. It is a foreign body situated in a most vital serous cavity.

2. There is no means of predicting in which cases the blood will ultimately be absorbed by natural processes, as opposed to those in which healing will be followed by scarring and deformities of the chest wall, the pleural cavity and the lung. The harmful effects of a hæmothorax, in those who survive the initial hæmorrhage, may not be manifest until the blood has clotted, until it has become organised or infected, or until the adhesions and fibrosis, which are its legacies, have so deformed the chest wall that normal function of the heart and lungs is impossible. As a young man a patient may suffer but little limitation of his ordinary activities on account of a rigid hemithorax, but the damage becomes progressively obvious as age advances.

3. A hæmothorax may become infected at any time between the moment it is produced and the time it is removed.

4. The blood is purposely left in the pleural cavity by some surgeons because it is argued that its presence produces hæmostasis by reason of the pressure the mass of fluid exerts upon the damaged lung. This conception is based upon several false assumptions. First, it is only likely to have any effect if the bleeding happened to come from the lung, and continued bleeding is almost certainly not of pulmonary origin. Secondly, unless the wound happened to be at the bottom of the lung, the level of the compressing blood might have to rise to the top of the chest before it staunched the flow. Thirdly, bleeding, either into a serous cavity or into the intermuscular planes, is more likely to continue into a hæmatoma, than it is if that hæmatoma be cleared out. Finally, the only circumstance in which aspiration is likely to start a fresh hæmorrhage is when it has been carried to such a point that a high negative pressure exists in the pleural cavity.

TREATMENT BY REPEATED ASPIRATIONS

To be really effective aspirations should be started within 24 hours of the time the patient has been wounded. If [illegible]ditions in the forward area are such that this is [illegible]cticable, treatment should be started as soon as possible afterwards. A delay of 5–6 days means that the difficulties of getting the pleural cavity dry are greatly increased. Air replacement should not be done unless the underlying lung is atelectatic.

Efficient management of a hæmothorax demands frequent aspirations, and these may be difficult to do. The tumult and concussion of a modern battle so disturbs the nervous system of many wounded men that they strongly resent repeated aspirations of the chest, and the mere contemplation of further needling causes much anxiety. Such men will readily consent to any major operation which may be necessary, provided it be done under general anæsthesia, because they can "go to sleep." The remedy lies in the liberal use of phenobarbitone or other sedatives, anæsthetisation of the proposed aspiration site with a *fine* and *sharp* hypodermic needle, and the use of plenty of local anæsthetic. It is imperative not to hurt such a patient if aspirations are to be carried out daily.

In most chest injuries the diaphragm upon the affected side is raised considerably. Puncture of the abdomen is likely to result from any aspiration made too low. As a general observation I would say that aspirations of the pleural cavity are often done too low, just as pleural drainage is apt to be too high. There is a reason, apart altogether from the position of the diaphragm, why aspirations should be done fairly high in the chest: the fluid at the top of a hæmothorax is liquid and easy to draw off, while the fluid at the base contains clots and fibrin which are apt to obstruct the needle.

When aspirations cease to yield a ready flow of fluid blood it is generally said that clotting has occurred. This may be a convenient explanation, but it often bears but little connexion with the actual state of affairs inside the pleural cavity. It has already been mentioned that in every hæmothorax after a few days some clots will be found at the bottom of the space; but to many clotting suggests that the whole mass of material has been converted into a solid from a liquid state. Massive clot is a definite entity but is comparatively rare, whereas difficulty in aspirating the blood is common. It is generally due to faulty selection of the correct site, or to the presence of isolated clots, fibrin and loculation. It is quite usual to find several pints of fluid blood in the chest of a patient who is said to have a clotted hæmothorax.

A hæmothorax may be difficult to aspirate not only on account of clots and loculation but because of fine threads of fibrin which float in the blood: these become engaged in the lumen of the needle as soon as suction is applied. In one such case in which the pleural cavity was ultimately found to contain 5 pints of fluid blood, it was only possible to get out a few cubic centimetres at a time, and the erroneous diagnosis of massive clot was made.

PRACTICAL PROBLEMS

The question of how best to manage a case of hæmothorax is not always easy to answer, and circumstances modify the treatment. To illustrate this point several different types of case will be mentioned.

Hæmothorax which responds rapidly to a few simple aspirations.—In most of these cases the bleeding has stopped soon after the injury had been sustained, and serial X-ray examinations demonstrate that the fluid in the chest shows no tendency to accumulate afresh, but decreases with each successive treatment. In some a relatively large collection of blood can be completely eliminated by one or two aspirations, and the results are excellent in every way. In 2 of my cases a massive serous effusion appeared after the blood had been almost completely evacuated; both of these men did well as soon as the effusions had been taken off.

Massive h[illegible]
the patient [illegible]
the bleeding
appears clir[illegible]
be started immediately.

When a great deal of blood is present the difficulty is that it cannot all be taken out of the pleural cavity at one sitting, and that which remains is augmented by the effusion which forms, so that the volume of the fluid can only be reduced in a step-ladder fashion. Under fortunate conditions repeated aspirations at regular intervals will produce a good result in the end, but only too often the exudate, which continues to collect between aspirations, makes the treatment difficult, protracted, and wearisome to the patient. If aspirations are not producing a rapid improvement a thoracoscope should be introduced into the pleural cavity, and all the blood, clots and fibrin sucked out. To be successful this operation should be performed early in the treatment before the lung has been bound down, and before the contents are too solid to suck out easily. Thoracoscopic aspiration is a minor procedure if done under local anæsthesia, and it converts a difficult case into one which is easy to manage. Air is bound to gain access to the pleura during the operation, and this should be taken off after the cannula has been removed.
[illegible] leura after operation,
[illegible] to a few additional

[illegible] *continues slowly but persistently for many days or even weeks.*—These are generally cases with injuries to the ribs and the chest wall; the bleeding probably comes from parietal vessels or from the liver. Repeated aspirations may succeed in holding the actual volume of the fluid in check, but as time passes fibrin and clots are liberally formed, and a point is reached at which organisation
[illegible] ıral
[illegible] the
[illegible] een
[illegible] at
[illegible] hen
the deformities were already apparent, and have tried by decortication operations to secure re-expansion of the lung. In this small series the results were disappointing. The results of vigorous courses of breathing and physical exercises are equally disappointing in this gr[illegible]
lin[illegible]

In [illegible]

intercostal thoracotomy should be performed and the blood, serum, clots and fibrin evacuated as soon as the condition be diagnosed. There are two other reasons for advocating this step. First, it is general surgical experience that in cases of ingravescent hæmatoma the bleeding is often promptly controlled by turning out the accumulated blood even though the bleeding-point is neither found nor secured, and in practice this has been my experience in cases of hæmothorax. Secondly, though the risk of infecting a hæmothorax during the process of a few aspirations is small, that risk increases as more and more aspirations are done. A review of cases with this point in mind has provided conclusive evidence of the truth of this.

Hæmothorax which has clotted.—There are two statements, relevant to this group, which I believe to be wrong:

1. *That clotting in a hæmothorax is rare.*—If the patients are treated efficiently from the start the statement is true; but in modern warfare it is not always possible to do this, and from the cases reaching a coastal hospital it is evident that during periods of rush, at the front, aspirations were often not done for a number of days. It is in this group that clotting, of sufficient degree to make aspiration difficult or impossible, occurs quite commonly, but these are not cases of massive clotting.

2. *That clot is generally a signal that infection is about to occur.*—Here the cart has been placed before the horse, for I doubt if incipient infection causes blood to clot; the tendency is for infection to liquefy clot. A more probable explanation is that as aspirations become progressively more difficult, and the patient's back takes on the appearances of a pincushion, the risk of introducing infection increases; and one day the organisms are put in and the condition goes on to an empyema.

The treatment of a clotted hæmothorax is to open the chest as soon as the diagnosis has been made, to remove the contents of the pleural cavity, and to decorticate the lung, the parietal pleura, and the diaphragm. The results of this practice are good, provided the steps, recommended by Price Thomas and Cleland,[1] and designed to achieve early expansion of the upper parts of the lung as well as of the base, are carried out.

Hæmothorax, complicated by a foreign body retained in the lung.—The size and the actual position of the foreign [illegible]y have an important bearing on treatment. The [illegible]rks which follow do not apply to foreign bodies [illegible]h are very small, multiple, or situated in the hilum. [illegible]ll other cases the ideal early treatment (and in the [illegible]sence of a septic wound of the chest wall *early* signifies any time within the first 3–4 days) is thoracotomy.

At this operation the pleural cavity should be opened sufficiently widely to permit exploration; the blood should be sucked out; the foreign body should be located in the lung and removed along its track of entry (in really early cases) or by wedge resection of the piece of lung including the foreign body (in cases where the track has sealed over); the thoracotomy incision should be closed in layers, including the skin; the air should be taken out of the pleura with a pneumothorax apparatus, and penicillin left in; and finally the pleural cavity should be drained for 48 hours by a water-seal intercostal-tube placed at the site of election or by continuous suction drainage. This operation should be followed by aspirations of any blood or serum which may subsequently accumulate.

There are several reasons for recommending such an operation. First, the patient will almost certainly be convalescent within 10 days and cured within 2 months. Conservative measures at their very best give a second-rate result in a high proportion of cases. Secondly, the track which the foreign body makes, in its course through the lung, is exposed to contamination by organisms which reach the traumatised tissues from the air-passages (even assuming that no organisms have been carried in at the time of infection). There is thus considerable risk of infection arising not only in the lung but eventually in the hæmothorax as well. This is borne out by the relative incidence of infection, reported by many authorities since the beginning of the war, in cases of hæmothorax with and without a retained foreign body. Finally, in several of my cases, treated conservatively at first, a foreign body lodged in the edge of the lung has ulcerated out from its bed and fallen to the costophrenic angle. This was followed by one of two complications; either the patient became suddenly ill with the signs and symptoms of a tension pneumothorax superimposed upon the hæmothorax, or a virulent infection developed in the hæmothorax.

I do not suggest that all patients with the combination of a hæmothorax and a retained foreign body will certainly do badly if treated conservatively: but an important proportion of them will, and the good risks cannot be separated from the bad either by clinical acumen or by any other means.

Hæmothorax as a complication of abdominal wounds.—Any missile which enters the abdomen through the lower chest is apt to cause a hæmothorax. This statement is so obviously true that one may ask why the matter should be mentioned. The reason is that in a number of cases the attention of the surgeon is so focused upon the grave abdominal emergencies with which he is confronted that when he has operated successfully upon these conditions he tends, during the complicated period of postoperative management, to overlook the fact that a hæmothorax has slowly accumulated. This is particularly the case if shock and abdominal hæmorrhage have been so severe that the bleeding into the pleural cavity has not really started until some time after the abdominal operation has been performed; the physical signs which then occur at the base of the chest are only too apt to be regarded as evidence of "postoperative atelectasis" or "pneumonia."

CONCLUSION

> "After all, what we call truth is only the hypothesis
> which is found to work best." (The Golden Bough.)

In presenting these notes I have assumed that the reader is familiar with current literature on the subject of hæmothorax, and so have ventured to discuss points which are controversial, as well as contingencies which are not quite on the beaten track.

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[1] *Lancet.* In the press.

LOUSE-BORNE TYPHUS FEVER

TRIAL OF SERUM TREATMENT

R. S. STEVENS, M B CAMB.
CAPTAIN RAMC; GRADED PHYSICIAN

DURING the first six months of 1943, twenty-one cases of louse-borne typhus fever were admitted to a military hospital in the Middle East. Seven of these cases were treated with hyperimmune rabbit serum prepared by the Lederle Laboratories of New York.

EPIDEMIC FEATURES

The majority (15) were admitted between March and May at the height of an epidemic affecting the native population, in which 705 cases were treated in hospital. The total civil population of the district was about 120,000 (Dickie 1943); Services personnel ran to several thousands.

Of the cases to be described, a third came from docks operating companies and most of the remainder from Army or RAF workshops. Most of them had been directly supervising natives employed in large numbers in such establishments, and in only one was a history of close contact not established. Troops had b[illegible] instructed in the dangers of harbouring lice; s[illegible] patients said they occasionally found one on th[illegible] clothing, but only two men had seen them on clothing or body at a time consistent with the beginning of the incubation period. No lice were found on any of them on admission to hospital. Several men had abrasions on their hands or forearms, a fact which when taken with the low rate of louse infestation raised the question of direct infection by dried louse fæces shed from native garments on damaged skin; infection through conjunctivæ or nasal mucosa was also possible.

The 21 cases were all unimmunised, and represented sporadic infections from 19 different units; this reflects credit on the louse-control of the units concerned. The hospital personnel receiving and treating typhus were inoculated and none developed typhus.

CLINICAL FEATURES

The clinical picture of severe epidemic louse-borne typhus is so widely recognised that it is sufficient to

refer only to recent authorities (Mackenzie 1941, Megaw
cases of the 21 in this epidemic
antityphus (European strain)
by the Lederle Laboratories,
New York, was made available by the kindness of Brigadier-General L. A. Fox, field director of the USA Typhus Commission. The first case treated received the serum late and probably in insufficient quantity; the remaining 6 were treated earlier and with larger doses which were given in quantity and manner advised by General Fox on his first visit to the hospital. Of the 14 men who did not receive serum 5 died, and the inadequately treated patient died; of the 6 fully treated patients none died.

Initial symptoms of all cases.—Headache was always the first symptom, accompanied by malaise. Five of the 21 cases complained of early sore throat, 5 of vomiting, and 6 of shivering; backache and limb pains were common. Before the rash appeared, a temperature of 103°–104° F, a pulse-rate of 90–100 per minute, considerable prostration, a bloated and intoxicated appearance, very suffused conjunctivæ, and a horizontal leash of vessels from canthus to cornea were almost invariable features. The slight contraction of pupils "stressed by the
Ireland"
(Memoranda 1941
a "cup-
board, containing
of "gun-washings," or the "peculiar mousy odour," was only noted twice. Exotic smells are too ingrained in the Middle East to make this sign much more than a metaphysical exercise. The spleen was palpable by the fifth day in all cases but one, firm but not tender. Meningismus was seen five times, herpes labialis thrice. In the use of serum it is important to be prepared to make a presumptive diagnosis if possible before the rash has appeared, or at any rate become typical, for there is reason to associate its efficiency with the earliness of its administration. The average time of appearance of the rash was 4·4 days after onset. At first difficult to see, it became typical in a few hours.

Course of cases not receiving serum.—As the macular
hed its zenith, and when
l, the colour of the rash
etechiæ began to appear;
day, and they appeared
acules or independently.
From this time the rash faded gradually, a blotchy staining often persisting for up to a month. One profuse erythema of thighs seen on the fifth day and one general urticaria seen on the eighth were the only variants of the typhus rash. Fever averaged 14 days in recovering cases, was continuous as a rule but showed a pseudocrisis on about the seventh day in 7 cases (Megaw 1942). Final termination was by lysis or crisis in about equal proportions. Severe headache persisted throughout the fever, prostration increased, with drowsiness passing into coma, tremors occurred and the tongue became dry and shrivelled. Blood-pressure fell and the pulse became dicrotic. Mental confusion preceded coma;
of being alone were common.
5 had intractable terminal
a protracted though usually
uneventful convalescence.

EFFECTS OF SERUM THERAPY

The first batch of serum, only 80 c.cm., was given in two doses of 40 c.cm. each, intravenously, to a patient (case 7) on the sixth and seventh days; the course of the disease was not modified and he died on the ninth day of the disease. In the next 6 cases, 80 c.cm. was given as soon as the diagnosis was established clinically, 40 c.cm. going into a vein and 40 c.cm. into the muscles of the buttock; on the next day 40 c.cm. was given intramuscularly and on subsequent days 20 c.cm. intramuscularly, if and for as long as the patient appeared to require it; this was difficult to judge, there being no
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ns during the
, it was given
slowly—1–3 c.cm. per minute. Two physicians were present and the one not giving serum kept check on pulse, respiration-rate, and blood-pressure. No serious reactions occurred, but 3 patients complained of buzzing in the head, dizziness, "constriction of the Adam's apple," trembling, vomiting or the like; these sensations may have been emotional in part. Intradermal sensitivity tests done before the intravenous injections were negative in all cases.

Course.—The average duration of the fever was the same as in untreated cases, 14 days. The level of fever, however, was in general lower in treated cases. Table I shows the number of readings above certain temperature levels and pulse- and respiration-rates in recovered cases after the sixth day, by which time the cases had received the greater part of their serum. Termination of fever was by lysis in all cases. Two patients ran slight secondary fever (not higher than 101° F) of intermittent type for 14 and 12 days. (Three cases in the untreated group had similar fever for 9, 12, and 3 days.)

TABLE I—TEMPERATURE, PULSE, AND RESPIRATION READINGS AFTER THE 6TH DAY IN RECOVERED CASES

Readings were taken four-hourly in all cases

—	NON-TREATED (8 cases)		TREATED WITH SERUM (6 cases)	
Observations	No. of times	Av. per case	No. of times	Av. per case
Temperature				
Above 104° F	6	0·75	4	0·66
,, 103° F	95	12	30	5·0
,, 102° F	88	11	65	11
Total	189	24	99	16
Pulse-rate				
Above 140 per min.	12	1·5	nil	nil
,, 130 ,, ,,	21	2·6	4	0·66
,, 120 ,, ,,	57	7·1	32	5·3
Total	90	11	36	6·0
Respirations				
Above 40 per min.	48	6·0	nil	nil
,, 30 ,, ,,	119	15	88	14
Total	167	21	88	14

The development of the rash tended to "telescope," by which is meant that the full first phase was attained more rapidly and that the petechial stage developed earlier, the two phases running into each other. This is only an impression, and difficult to substantiate in a small series. Total duration of rash was about the same as in the untreated group.

Headache, prostration, and vomiting were absent or much less severe after treatment, and the patients themselves remarked on their subjective improvement. Mental confusion was absent in two treated cases, slight in three cases on one or two nights, and in the sixth case recurred at intervals over 14 days; the confusion was accompanied by urinary incontinence. One treated case developed severe hiccup on the ninth and tenth days (blood-urea on the ninth 60 mg. per 100 c.cm.); he recovered in spite of this usually fatal symptom.

The nursing staff, who cared for the whole series, all agreed that the treated group were much easier to nurse and were able to help themselves more readily and in a way that the untreated cases could never do at the same stage of the disease.

The attempt to use serum as early as possible led to its use in one case of typhoid fever and one of smallpox;
th
e right direction.
T
ed by the serum.

one patient who
both responded
side-effect. Deafness developed in five cases, of whom two had received serum; it did not persist for many days after defervescence. Several of the treated patients suffered from urinary retention; in only one was catheterisation necessary, and he developed cystitis which responded to sulphanilamide.

Serum rash was seen in five cases, appearing 10–14 days after the first dose and lasting about 3 days.

Convalescence was protracted in all cases, serum-treated and others. It has not been possible to determine whether the treated patients returned to work sooner than the rest. Convalescence should not, in present state of knowledge, be hurried—one man, not treated with serum, after an early return to his unit developed persistent tachycardia with extrasystoles.

Mortality (see table II).—Of fourteen cases who did not receive serum five died. Of seven who received serum the only one to die was treated at a late stage and probably with inadequate dosage; he was in the age-group 35–39, as were three of the other fatal cases; only one in this age-group survived. Six cases, given serum in larger dosage, recovered.[1] The average day of death was 11·3.

Autopsy was performed on all fatal cases. The general findings included a fading petechial rash; the blood dark and fluid; the heart muscle soft and flabby; the spleen enlarged and diffluent. Three cases had early hypostatic pneumonia, and four had an apparent excess of cerebrospinal fluid with visible pressure effects.

ILLUSTRATIVE CASE NOTES (*see figure*)

Not Treated with Serum

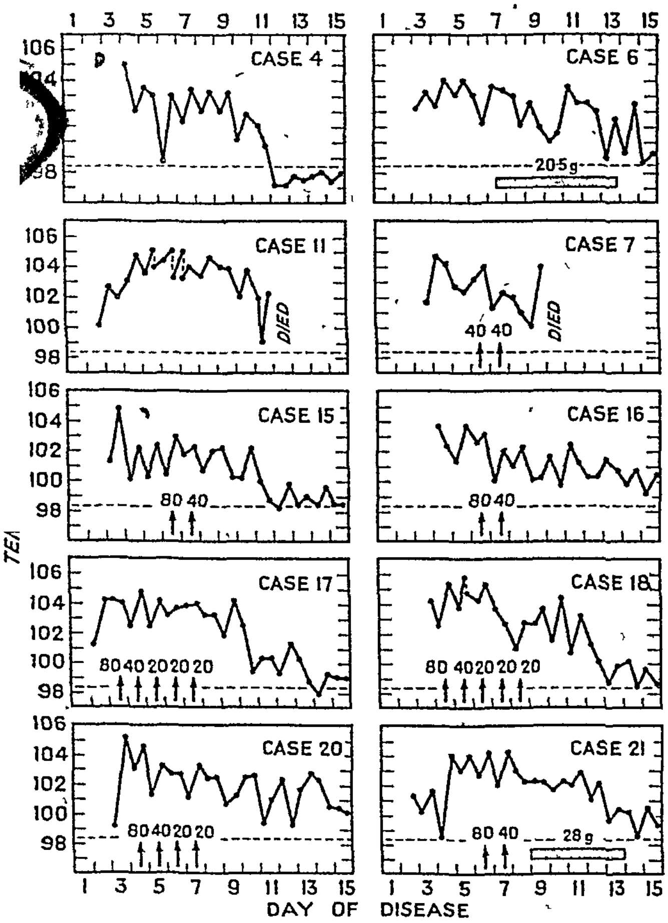
4.—Age 23. One of the least severe attacks and the shortest duration of fever seen. Note "pseudocrisis" on 6th day. Weil-Felix positive OX19 on 9th day, 1 : 320.

6.—Age 22. Seriously ill. Bronchopneumonia on 7th to 13th days. Weil-Felix positive OX19 on 15th day, 1 : 2560.

11. Age 30. Died 11th day. Weil-Felix negative throughout. Guineapig inoculated on day of death (12th) gave positive strain-isolation.

Serum-treated Cases

7. Age 38. Received serum intravenously, total 80 c.cm., on 6th and 7th days. Weil-Felix negative throughout. Guineapig inoculation gave positive strain-isolation on day of death (9th).



Temperature-charts of all cases treated with serum, together with those of three cases not so treated—case 4, a straightforward recovery; case 6, complicated by bronchopneumonia, followed by recovery; and case 11, a fatal case. Arrows indicate administration of serum, with dose in c.cm. Stippled areas indicate administration of sulphapyridine, with total dosage.

TABLE II—MORTALITY BY AGE-GROUP IN SERUM-TREATED AND OTHER CASES

Age-group (yr.)	No. of cases	Treated with serum	Deaths	
			Not treated with serum	Treated with serum
20–24	6	2	0	0
25–29	5	1	1	0
30–34	5	3	1	0
35–39	5	1	3	1
Total ...	21	7	5	1

15.—Age 23. Serum, total 120 c.cm., on 6th and 7th days. Recovery. Weil-Felix positive OX19 on 9th day, 1 : 320.

16.—Age 22. Serum, total 120 c.cm., on 6th and 7th days. Recovery after very serious illness. Weil-Felix positive OX19 on 9th day, 1 : 160.

17.—Age 36. Serum, total 180 c.cm., on 3rd, 4th, 5th, 6th, and 7th days. Recovered. Weil-Felix positive OX19 on 8th day, 1 : 320.

18.—Age 34. Serum, total 180 c.cm., on 4th, 5th, 6th, 7th, and 8th days. Recovered. Weil-Felix positive OX19 on 15th day, 1 : 256.

20.—Age 22. Serum, total 160 c.cm., on 4th, 5th, 6th, and 7th days. Recovered. Weil-Felix positive OX19 on 10th day, 1 : 512.

21.—Age 33. Serum, total 120 c.cm., on 6th and 7th days. Complicated by bronchopneumonia, treated with sulphapyridine on 8th to 12th days. Recovered. Weil-Felix positive on 14th day, 1 : 256.

PATHOLOGICAL INVESTIGATIONS

White blood-cell count.—The highest count recorded was 14,800 on the third day (71% polymorphs, 27% lymphocytes, 2% mononuclears). The lowest figure was 3600 (differential not recorded). The average figure for the series taken on the 5th day was 8900 (polymorphs 71%, lymphocytes 26%, mononuclears 3%).

Three attempts to find *Rickettsial bodies* early, by sternal puncture, were unsuccessful.

Weil-Felix reaction.—Felix (1941) has stated that this reaction is positive in 75% of the cases on or before the 4th or 5th day of the illness, and that the maximum titres reached shortly before or after defervescence are very high. Other authorities (Findlay 1941, Megaw 1942) have stated that in most cases the reaction is positive before the end of the first week. In this paper it is proposed to accept a titre of 1 : 100 as significant and to confine the account to agglutinations with *Proteus* OX19 (although agglutinations with OX2 and OXK were carried out).

Not all cases were tested on the same day of the disease but the majority were tested on the 5th, 8th, and 12th days. The earliest readings over 1 : 100 were made in two cases on the 8th day. The average first positive was not obtained until 11·6 days. The first positive titres ranged from 1 : 160 (9th day) to 1 : 2560 (15th day). Details of subsequent rise of titre are omitted.

Three cases died without any significant rise in titre. The first of these died on the 9th day, with nil titre on the 5th and 9th days; the second died on the 12th day with titres of 1 : 40 on the 7th and 11th days; the third died on the 11th day with no rise in titre on the 6th and 9th days; autopsy of these three cases showed changes characteristic of typhus, and a positive strain-isolation was obtained from the blood of two of them.

Rickettsial agglutinations were performed by Major C. E. van Rooyen, RAMC, on the serum from six cases. All gave a high-titre response of epidemic type.

Guineapig inoculations were performed in six cases, five of which produced a positive strain-isolation.

Urine.—Febrile albuminuria was the rule, and persisted in one case only, the man who developed cystitis. Hyaline or granular casts were seen in a third of the series.

Cerebrospinal fluid.—Lumbar puncture was performed in three cases in the pre-eruptive stage. The fluid was clear, colourless, at a pressure within normal limits; cells numbered less than 5 per c.mm.; protein ranged from 35 to 45 mg. per 100 c.cm. There was no increase of globulin.

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[1] A seventh case was treated with similar dosage of serum from our supply at another military hospital in the area and is mentioned by courtesy of Lieut.-Colonel Everley Jones, RAMC; he recovered, but has not been included in this series.

SUMMARY

Twenty-one cases of louse-borne typhus fever were treated at a military hospital in the Middle East in 1943.

Antityphus serum (Lederle), supplied by the US Army medical services for clinical trial, was used in seven cases.

Six cases were given large doses of serum as soon as clinical diagnosis was established and all recovered. A seventh case, given a smaller dose, died.

No attempt is made to draw conclusions from so small a series, but reasons are given for believing that the serum has a beneficial effect by modifying the severity of the course and reducing the toxæmia.

Emphasis is placed on giving the serum as early as possible and in adequate dosage.

I offer my thanks to Colonel W. Russell, MC, lately commanding officer of the hospital where these cases were seen, for permission to publish this paper, to Brigadier-General L. A. Fox, field director, USA Typhus Commission, whose generous supply of serum made this work possible; to Lieut.-Colonel J. C. Hawksley, RAMC, for his stimulating advice and assistance; to Captain W. R. Gauld, RAMC, for the notes on one case; to Major G. C K. Reid, RAMC, for the pathological investigations; and to Miss B. M. Currie, TANS, and the other members of the nursing staff.

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EFFECT OF TEMPERATURE ON ISOAGGLUTINATION IN BLOOD-GROUPING

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It is generally accepted that isoagglutination by human anti-A and anti-B agglutinins is stronger at room or refrigerator temperatures than in the incubator. Hence the usual recommendation is to read blood-grouping tests performed in tubes after two hours at room temperature (MRC 1943). According to Hara (1930), however, there is no essential difference between typing blood at 37° C and in the refrigerator, though agglutination after one at the higher temperat finding that the titre

after the tubes had stood for some hours; no observations were made after the shorter periods often adopted in testing blood groups. Accordingly this point has been investigated here.

Suspensions containing 1–1·5% of red cells in 0·9% saline were prepared from the clots of blood samples sent to the department for the Wassermann test; 1 vol. of suspension was mixed with 1 vol. of serum (O, A, and B) or serum dilution and sometimes 1 vol. of 0·9% saline was added also. The sera used had previously been heated to 55° C for half an hour. Sera and cell suspensions were kept separately at the required temperatures for 20 min. before mixing. Those mixtures to be kept at the lower temperature were made just before the mixtures in the incubator, but the results of the latter were read before the former. In this way conditions were favourable to agglutination at the lower temperature; hence results in favour of incubation are more definitely proved.

Agglutination usually occurred more rapidly in the tubes kept at 37° C than in those at room temperature or in the refrigerator. The first readings (after 5–15 min.) nearly alv at 37° C, especially it amounts of serum, e A and B sera were used; 64 out of 68 sera examined on titration behaved in this way. Exceptionally agglutination was quicker at room temperature than in the incubator. After 1 hour there was no significant difference in the readings or often agglutination was greater at the higher temperature. The reading after 2 hours usually showed the highest titres at room temperature, though the differences were small; observed. The table gives

Thus the final agglutin resultant of two influences ways by temperature and which may vary according to the individuality of different sera and cell suspensions.

CONCLUSIONS

The agglutination of A and B red cells by O, A, and B sera at different temperatures has been investigated. The reaction is usually quicker if the tubes are incubated at 37° C than if they are kept at room temperature or at 2–3° C. The end titres, when read after 2 hours, may be the same at higher and lower temperatures, or the end titre at 37° C may be somewhat lower, as is generally accepted.

The incubation method is of practical value as a means of avoiding false positive results due to cold agglutination or panagglutinability and polyagglutinability of the red cells. This is particularly true when red cells alone are grouped without examination of the serum—and in small laboratories, which do not possess a stock of standard red ed cells alone is the procedur For the incubation method tul e there would be too much unless special precautions were taken.

My thanks are due to Prof. H. Sachs for his suggestions and to Prof. R. A. Q. O'Meara for the facilities of the department of bacteriology; also to the Medical Research Council of Ireland for a personal grant.

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AGGLUTINATION OF GROUP A RED CELLS BY GROUP B SERUM AT VARIOUS TEMPERATURES READ AFTER VARIOUS INTERVALS

0·1 c cm serum diluted	At 37° C			At room temperature			In refrigerator		
	10–15 min.	1 hr.	2 hr.	10–15 min.	1 hr	2 hr.	10–15 min.	1 hr.	2 hr.
1 : 1	++++	++++	++++	+++	++++	++++	++	+++	++++
1 : 2	+++	++++	++++	++	++++	++++	+	+++	+++
1 : 4	++	+++	++++	+	+++	++++	–	++	+++
1 : 8	+	+++	+++	–	+++	+++	–	++	++
1 : 16	±	++	+++	–	++	++	–	+	++
1 : 32	–	+	++	–	+	++	–	±	+
1 : 64	–	–	–	–	–	+	–	–	–
No serum	–	–	–	–	–	–	–	–	–

The number of + signs indicates the strength of agglutination.

RADIOTHERAPY IN OSTEOCLASTOMA

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OSTEOCLASTOMA was divided by Kirklin (1932) into two radiological types, the trabeculated and the osteolytic, which he said occur in almost equal numbers. The trabeculated form, or giant-celled tumour, is well known, but the osteolytic form is seldom mentioned.

Geschickter and Copeland (1936), in their account of osteoclastoma, say that trabeculation disappears as the lesion advances, thus giving rise to the osteolytic picture. Jansson (1937) sees no reason for diagnosing two types; he holds that the osteolytic type is only a more advanced form, and he describes 3 cases developing from trabeculated into osteolytic. Brailsford (1937) agrees with this view. Herendeen (1932), however, considers that the radiological picture depends on the rate of growth. Rapid growth produces an osteolytic picture, while a tumour growing more slowly appears trabeculated.

It is still uncertain, therefore, whether there are two distinct types, or merely two stages in one disease. The following cases of the osteolytic stage or type illustrate the difficulty of differential diagnosis and also show the appearance of trabeculation as a response to irradiation. Two of the tumours were in the lower end of the femur, and one in the lower end of the radius; these two sites are common in both types of osteoclastoma, which usually involve both epiphysis and metaphysis.

CASE-RECORDS

CASE 1.—A woman aged 37 was admitted in 1936 with a history of 6 months' pain and stiffness of the left leg. About 3 months before admission she had twisted her knee, since when it had been swollen. She looked well nourished, and general examination revealed nothing abnormal. The left knee-joint and lower end of the femur showed a fusiform swelling: movements were limited, and there was slight wasting of the leg muscles. The skin over the swelling was tense though not red. There was local rise of temperature, but no pulsation: the swelling was hard, but there was no eggshell crackling. No enlarged glands were palpable in the groin. The blood-count was normal and the Wasser[illegible] reaction negative.

X-ray examination in May, 1936, showed an asymmetrical, globular, rarefied area on the outer side of the lower end of the femur involving epiphysis and metaphysis; it extended into the soft tissues along its outer margin, but not into the joint cavity (fig. 1). The expanded bony shell of the tumour was extremely thin and was absent in one part. There was only a very small projection of the cortex of the shaft into the tumour area, but marked lipping of the periosteum. The central portion of the tumour was rarefied, and no strands of bone were seen crossing it, but a small area of the bone surrounding the rarefaction had a foam-like structure. The tumour was nowhere sharply demarcated from adjacent bone on the shaft side.

Sarcoma had been diagnosed, but on admission this diagnosis was changed to osteolytic osteoclastoma. Amputation had been suggested, but it was agreed to try irradiation. X-ray treatment was begun in May, 1936. At first the swelling grew more tender and increased in size, as is usual in these cases, but by the end of the 6-weeks course the patient was free from pain. Serial radiograms over the next 3 months showed steady enlargement of the rarefied area,[1] disappearance of the marginal sponge-like structure, and absorption of almost all the cortex along the lateral margin. Then the swelling began to subside, but movement remained extremely limited.

During the next 5 months recalcification began. At first several pin-point opacities were seen in the rarefied area; this was followed by haziness of the whole tumour; and later several fine strands became visible. The cortex gradually became re-established, and the whole tumour assumed a sponge-like architecture (fig. 2). Coarse strands were then laid down somewhat irregularly throughout the foam-like structure, and a firm buttress of bone was seen at the site of the periosteal lipping. The appearance 22 months after treatment began to resemble that of a trabeculated osteoclastoma.

During the next 4 years recalcification continued (fig. 3). Though the patient was walking easily without a calliper a year after treatment, full range of movement at the knee returned only gradually. Seven years after treatment she was in good health and free from disability. The skin in the irradiated areas was epilated, but it showed no atrophy or telangiectasis.

Although a biopsy was not obtained in this case, its radiological similarity to case 2 (which was proved histologically) and its response to irradiation confirm the diagnosis.

CASE 2.—A woman of 23 was admitted in 1941, having had pain in the right knee for 4 months. This was attributed to rheumatism, but as there was no response to treatment she was sent to hospital. On general examination nothing abnormal was found. The right knee-joint and lower end of the femur were swollen and movement was limited. The swelling was firm, but there was no eggshell crackling, and no reddening of overlying skin. The local temperature was raised and there was pulsation. The knee-joint contained a large effusion. No enlarged glands were found in the right groin, and radiography of the chest showed no abnormal shadows. The radiogram of the lower end of the right femur was exactly similar to that of case 1, except that the tumour involved the medial condyle of the femur and there was no foam-like appearance round the rarefied area, but there was gradual diminution of the density of the shaft towards the rarefied area. The periosteum was lipped, and largely because of this a diagnosis of osteolytic osteogenic sarcoma had been made. Biopsy, however, revealed the true nature of the tumour—a typical osteoclastoma (fig. 4).

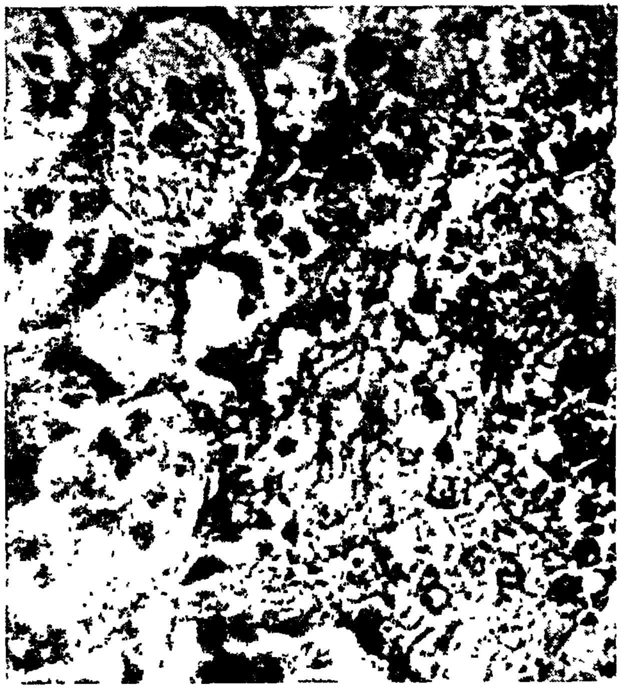
Fig. 4—Case 2: section of tumour at lower end of femur, showing typical osteoclastoma.

X-ray treatment was begun in February, 1941. The course lasted 6 weeks. Serial radiograms showed a response similar to that in case 1. An initial apparent increase in the size of the tumour was followed by gradual recalcification which is still progressing, but has not yet reached the stage seen in case 1. Movement of the knee is not yet full.

CASE 3.—A woman of 37 was admitted in 1932 because of 5 months' swelling of the right wrist, with slight pain. She appeared otherwise healthy. The dorsum of the wrist showed an ill-defined swelling at the level of the radial styloid process, but the flexor aspect was unaffected. The skin over the swelling was normal but it was tender on firm pressure and fluctuation was felt. Flexion and extension of the wrist were both somewhat limited; movements of the fingers were normal. Radiography in November, 1932, showed a globular rarefied area asymmetrically placed on the medial side of the lower end of the radius involving both epiphysis and metaphysis, but without extension into the joint cavity (fig. 5). The expanded bony shell of the tumour

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[1] Brailsford (1943) in a paper published since the above was written has also emphasised this point.

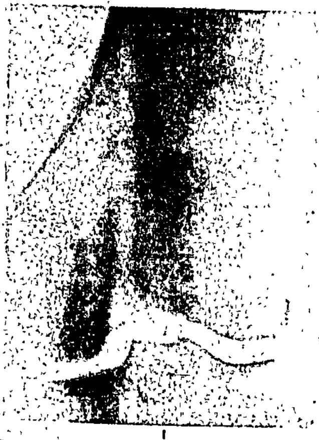

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Fig. 1—Case 1, May 5, 1936: osteolytic osteoclastoma at lower end of femur showing periosteal lipping, which at first led to a diagnosis of sarcoma.

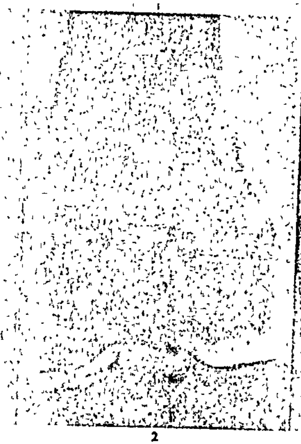

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Fig 2—Case 1 [illegible] [illegible], showing appearance of trabeculæ

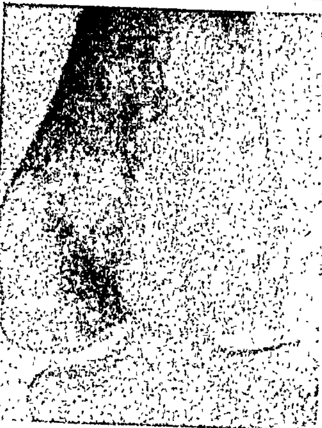

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Fig. 3—Case 1, May 6, 1940: showing amount [illegible]

was extremely thin and was perforated at one point. Along the medial border, the cortex of the shaft projected into the tumour area. The central portion of the tumour was rarefied, but faint clear-cut trabeculation was visible around its margins. There was no sharp demarcation of the tumour area from the adjacent bone, and no periosteal lipping.

Osteoclastoma was diagnosed radiologically, and X-ray treatment began in November, 1932. The response (fig. 6) was similar to that seen in cases 1 and 2. Owing to insufficient support of the wrist during the rarefying process after irradiation, the thin bony wall fractured and there was slight collapse of the distal end of the radius. The patient was able to use the hand normally within a year, although slight limitation of supination persisted. X-ray examinations showed that the involved area continued to grow in density throughout the next 10 years. The patient remains well 11 years after treatment.

Since none of these patients were under observation before they were sent for treatment, there are no serial films to show whether trabeculation preceded osteolysis. If such films had been available, the diagnosis would have been simple. But actually in 2 of these cases, the diagnosis from osteolytic sarcoma was very difficult both clinically and radiologically.

DISCUSSION

Kirklin states that there is no evidence of "periosteal irritation" in osteoclastoma. Brailsford and others hold the same view. Periosteal lipping has been usually taken as one sign among others that a bone tumour is sarcomatous, and in cases 1 and 2 a diagnosis of sarcoma was made by the surgeon because such periosteal reaction was observed. [illegible]

[illegible] m

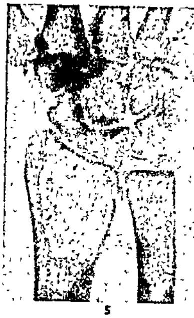
[illegible] 1

[illegible] every 4 at the Memorial Hospital, New York, a correct diagnosis [illegible]

[illegible] or a benign.

Although both sarcoma and osteoclastoma may show a central destructive lesion with a peripheral osteogenesis (periosteal lipping), the character of the tumour margin on the shaft side often differs in the two. In a sarcoma the adjacent bone has an irregular appearance, which has been described as moth-eaten; whereas in osteoclastoma it may be foam-like (i.e., a more regular structure round the margin, as in case 1), or the density of the shaft may gradually diminish towards the tumour area as in case 2, or there may be faint clear-cut trabeculation as in case 3. Where biopsy is impossible, diagnosis may be helped by the response to irradiation. About 12 weeks after treatment of an osteoclastoma (as demonstrated in these 3 cases) [illegible] show early calcification. This [illegible] and trabeculation reappears [illegible] area, giving the appearance of a trabeculated osteoclastoma. The trabeculæ are, however, less clear-cut than in an untreated case, and the loculi between the strands are somewhat hazy. In sarcoma and in metastatic deposits, on the other hand, recalcification does not usually show honeycomb formation.

These 3 cases demonstrate that radiotherapy can give a satisfactory result in osteolytic osteoclastoma; and cases of the trabeculated type have shown an equally good response, with no recurrence. Formerly most cases of this kind were treated by surgery, but Pfahler and Parey (1932) believe that irradiation is definitely superior. Ewing (1932) states that while there are rare cases of osteoclastoma in which amputation may



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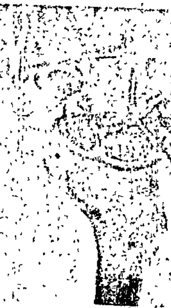

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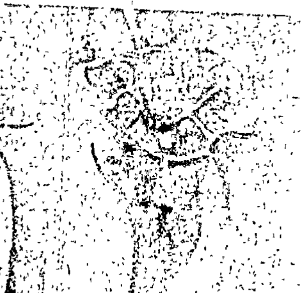

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Fig. 5—Case 3, Oct. 22, 1932: osteolytic osteoclastoma at lower end of radius showing faint trabeculation around the rarefied area.

Fig. 6—Case 3, June 26, 1933: after irradiation, showing appearance of trabeculæ during recalcification.

Fig. 7—Case 3, Jan. 16, 1941: showing amount of recalcification 9 years after irradiation.

have to be done (e.g., very large tumours, very vascular tumours and, those with malignant change), surgery should generally be avoided. Bad surgical results he had seen included recurrence, infection and malignant transformation.

SUMMARY

Three cases of osteolytic osteoclastoma are reported. Two of these showed the periosteal lipping generally considered pathognomonic of sarcoma. Under irradiation treatment the tumours developed trabeculation. The clinical response was good.

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MENINGITIS DUE TO PS. PYOCYANEA

PENETRATING WOUNDS OF THE HEAD*

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PENICILLIN has affected the problem of infection in cerebral war wounds, for meningitis due to penicillin-sensitive organisms seldom ends fatally; no such fatal case has occurred here since the advent of penicillin therapy. At the same time, cerebral infection with gram-negative penicillin-resistant organisms remains a hazard. The purpose of this paper is to review the clinical and pathological findings in 11 cases of meningitis due to *Ps. pyocyanea* and to discuss the probable pathogenesis of the disease in the various cases.

Between June 8 and Aug. 20, 1944, some 400 patients with head wounds were evacuated from France to this hospital. During this period there were 22 deaths, 8 of them due to *Ps. pyocyanea* meningitis. Three additional [illegible] during the period under consideration, 1 [illegible] ince proved fatal. Of these 11 patients, 9 [illegible]fected wounds communicating with the subarach[illegible]pace or with the ventricle. Of the remaining 2 [illegible], 1 was an apparently uncomplicated penetrating wound of the brain and the other a perforating wound without brain abscess.

From June 8 to about July 20, 1944, patients were evacuated from France by devious routes, mainly by sea, arriving at this hospital 3–5 days after wounding. After July 20 most patients were evacuated by air and arrived more quickly.

PENICILLIN

Before June 20, 1944, patients with infected head wounds, as manifested by the presence of liquid pus, yellowish purulent exudate, and necrotic foul-smelling brain, were treated with penicillin solution administered by one or more of the following routes—

1. By intramuscular injection 3-hourly.
2. By injection into lumbar theca daily.
3. By instillation 6–12-hourly through a rubber tube remaining in the head wound.
4. By injection with syringe and needle into the wound after the scalp had been closed at operation.

After June 20 no rubber tube for the instillation of penicillin solution was placed in a wound. All wounds were firmly sutured at operation; only 2 wounds have been drained postoperatively, and then with a Penrose tube for 24 hours. With some exceptions, penicillin solution has been given intrathecally only when there have been clinical signs of meningitis. The cases developing *Ps. pyocyanea* meningitis hence fall into two groups. The first group consists of 9 patients (cases 1, 2, 4, 5, 6, 7, 9, 10, 11) treated before June 20. The second group (cases 3 and 8) occurred after June 20 and consists of 2 patients with brain abscesses.

Between June 8 and Aug. 20, 74 patients received penicillin solution intrathecally or by local intracranial administration. The figures are shown in table I.

The question arises: Could the solution of penicillin injected intrathecally or instilled locally have been contaminated with *Ps. pyocyanea*? All penicillin was dispensed with sterile technique by the pathological laboratory, using an automatic dispenser, and daily bacteriological check of samples passed through the dispenser was negative. At first penicillin for intramuscular and intrathecal use was dispensed in 60–100 c.cm. amounts at a strength of 5000 units per c.cm. Solutions for local instillation were made up in similar quantities at a strength of 1000 units for several patients. Following recognition of the early cases of *Ps. pyocyanea* meningitis, all bottles in use as penicillin containers were recalled from the wards to the pathological laboratory. All were sterile on culture. From that time penicillin was dispensed in 20 c.cm. amounts for intramuscular use, and in 10 c.cm. amounts for [illegible] in individual bottle being reserved for [illegible] a period of 20 days sterility tests were done on every bottle before issue and after return from the wards. All were sterile on issue. The dregs of two bottles which had *contained penicillin solution at a strength of 1000 units* per c.cm. (only one of these was returned from a neurosurgical ward) yielded *Ps. pyocyanea* on culture. No change in the technique of dispensing penicillin had been made, save that, towards the end of the 20-day period, penicillin solution for intrathecal use was Seitz-filtered and this has been continued.

From these facts it was concluded that wholesale contamination of penicillin solution was unlikely. If this was occurring it could reasonably have been expected that some of the patients receiving penicillin intramuscularly would have shown signs of infection. It is known that the intramuscular injection of penicillin solution heavily contaminated with *Ps. pyocyanea* may produce red indurated extremely painful areas at the sites of injection, with fever up to 105° F and prostration (Magner 1944). Nothing like this happened here. Furthermore, 2 patients who developed meningitis received penicillin solution which bacteriological tests had proved sterile before use, and the residue in the containers was also proved sterile after return from the wards. Nevertheless, the method of handling penicillin at the beginning is open to criticism, and in 2 cases, to be considered later, we believe that contaminated penicillin solution may have been responsible for the meningitis.

TABLE I—ROUTES OF PENICILLIN ADMINISTRATION IN 74 CASES OF HEAD INJURY

Penicillin	Number of cases	
	June 8 to 20	June 21 to Aug. 20
Intrathecal only	9	23
Intrathecal plus local instillations by tube	22	0
Intrathecal plus local injections at operation	..	8
Local injections at operation only	..	12

All patients received intramuscular penicillin.

SURGICAL TECHNIQUE

The neurosurgical wards were staffed with experienced and highly trained nursing sisters. The specific problem of cross-infection with gram-negative organisms in relation to penicillin therapy, as since emphasised by McKissock and others (1944), had been discussed with them before D-day. They had long followed the general principles involved in the prevention of cross-infection, and a dressing technique had been established during the previous four years which had given rise to no difficulty. The procedure regarding dressings was carried on as before D-day. Instruments, syringes, needles, and *dressings were sterilised by autoclaving and delivered to* the wards in small bundles for individual patients. Masks with 'Cellophane' inserts were worn. Gloves were not worn but hands were washed and "no-touch"

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* Read at a meeting of the Society of British Neurological Surgeons on Nov. 4, 1944.

TABLE II—CLINICAL, BACTERIOLOGICAL, AND AUTOPSY FINDINGS IN 11 CASES OF MENINGITIS

Case	Admitted	Clinical summary	Penicillin			Meningitis		Wound cultures		Autopsy
			Local	Intrathecal	Intramusc.	Onset	Duration (days)	On admission	Later	
1	[illegible]	[illegible]	+ T	+	+	9 days after removal of eye	15	No growth from eye socket	Tube and wound: *Ps pyocyanea* 2 days before meningitis	Laceration and softening both frontal lobes, not communicating with ventricle
2	June 9	Cranio facial-orbital wound. Eye removed. General debridement Packing and tubes	+ T	+	+	0 days post op	11	*Staph aureus*	Tube and wound: *Ps. pyocyanea* 2 days before meningitis	Laceration and softening both frontal lobes, communicating with ventricle
3	July 19	Left temporal penetrating wound. Large metallic FB retained in midline Incom- [illegible]	..	+ C	+ C	2 days after drainage of abscess	77	Extruding brain *Staph. aureus* and coliforms	Opn for abscess: no growth from pus. *Ps. pyocyanea* on day of onset of meningitis	Large abscess left frontal lobe, communicating with ventricle
4	June 12	Frontal parasagittal penetrating wound with bone fragments crossing midline below falx. Incomplete opn elsewhere. Wound infected CSF leak on 5th day after opn	+ T	+	+	5 days after 2nd opn	10	*Staph. aureus*	Coliforms from wound on day of onset meningitis	Deep laceration of frontal lobe, communicating with ventricle
5	June 19	Parasagittal parietal penetrating wound; large fungus. Incomplete opn elsewhere. Infected on admission. Multiple bone fragments. Debrided, packed. (Infective cerebritis)	+ TP	+	+	3 days after 2nd opn	3	*Staph aureus*	*Ps pyocyanea* after meningitis	Deep laceration, communicating with ventricle
6	[illegible]	[illegible]	+ TP	+	+	1 day after opn for multiple abscess	30	*Staph aureus* and *Strep. viridans*	*Ps pyocyanea* after meningitis	Large brain defect; small abscess in left parietal lobe communicating with ventricle
7	June 18	Left occipito-mastoid wound, brain extruding Wound infected At opn subdural spaces widely opened	+ N	+	+	2 days after opn	23	*Staph. aureus* and *Ps. pyocyanea*	..	Recovered
8	July 6	Penetrating parietal wound Opn else- [illegible]		+ C	+ C	7 days after drainage of abscess	42	Non hæm strep. and *Staph aureus*	..	Recovered
9	June 16	Penetrating wound left cerebellum to right parietal lobe Opn elsewhere. Infected wound. Brain presenting	..	+	+	4 days after admission	18	*Staph aureus* in opn wound (entry)	..	Small track of liquid purulent material leading from track of missile into ventricle
10	June 13	Penetrating left frontal wound. Incomplete opn elsewhere. Brain extruding. Debridement. Tube extradural	+ T	+	+	6 days after opn	20	*Staph. aureus*	*Ps pyocyanea* after meningitis	Laceration left frontal lobe Well walled off. No communication with ventricle
11	June 12	[illegible]	..	+	+	3 days after evacuation of subdural hygroma	3	Coliforms from healing wound of entry		Small healed entrance wound. Narrow track of necrotic tissue through cerebellum to right parietal lobe. No communication with ventricle or area of deep sepsis

T = tube; P = packing; N = needle; C = controlled.

technique carried out. For a period (June 8–20) tubes were left in infected cerebral wounds to allow the instillation of penicillin. These wounds were dressed with tullegras, 'Phofilm,' and gauze, and the tubes, plugged with wooden applicators, were brought out [illegible] covered with [illegible] which could be [illegible]ntaminating the tube. At the time of injecting penicillin, tube and applicator were handled with sterile forceps.

'Cetavlon' was used extensively for its detergent and cleansing effect. This may have been a factor in allowing the growth of *Ps. pyocyanea* where it was not followed by alcohol or iodine, for cetavlon was later found to be ineffective against this organism. Though no specific break in surgical technique has been discovered the possibility remains that, under the pressure of work, minor relaxations may have occurred, despite the conscious effort of all concerned to maintain standards Potent factors favouring air-borne cross-infection were that the wards were filled and the beds of necessity were situated close together. A bacteriological air-check carried out on all wards during this period of maximum activity showed that *Ps. pyocyanea* was air-borne in three of the wards to which these casualties were admitted.

In the operating-rooms there was no deviation from the established technique. Caps, masks, gowns, drapes, and gloves were available at all times.

ANALYSIS OF CASES

Consideration of the pertinent clinical, bacteriological, and pathological data concerning each case is necessary to evaluate the factors responsible for the development of meningitis. At autopsy the meningeal exudate was constantly found over the base of the brain. In most cases a mat of pale yellow fibrinopurulent exudate extended posteriorly from the region of the optic chiasma in the basal cisterns, sweeping over the pons and anterior surfaces of the cerebellar hemispheres, down the medulla oblongata and spinal cord. The ependyma of the ventricles was coated with a thick slimy yellowish exudate in every case whether or not the cerebral wound communicated with the ventricular system. The significant findings in each of the cases are summarised in table II.

In 3 instances (cases 1, 2, and 7) *Ps. pyocyanea* was grown on culture of the wound shortly before the development of clinical signs of meningitis. However, *Ps. pyocyanea* was cultured from the wound of 1 patient (case 3) on the day of onset of meningitis, and in 1 case (4) "coliforms" were recovered. In every case cultures of the cerebrospinal fluid repeatedly yielded *Ps. pyocyanea*, and the organism was grown on culture of the subarachnoid space at autopsy in the fatal cases. In most instances the organism was readily recognisable on blood-agar plates by the typical greenish fluorescence and sweetish odour. A few strains were achromogenic and might have been confused with other organisms of the coliform group. Repeated subculture and fermentation reactions allowed positive identification of the organism in each case.

Group 1.—Cases 1–9 should be considered as a group for in every instance communication between wound and subarachnoid space or ventricle was verified. Of these 9 patients, 5 (cases 1, 2, 4, 5, and 7) were admitted with clinically infected wounds, case 5 having in addition a cerebral fungus. A tube for the local instillation of penicillin was used in 4 patients (1, 2, 4, and 5). In the 5th case (case 7) *Ps. pyocyanea* was grown on culture of the temporal muscle, which, after operation, was in contact with the cerebrospinal fluid. In cases 1, 2, 4, and 5 it is believed that hospital cross-infection was responsible for the infection of the head wound with *Ps. pyocyanea*. In each case the wound was kept open by a rubber tube. In these cases, and in case 7, in which *Ps. pyocyanea* was present in the wound on admission, it seems probable that extension of infection from the superficial parts of the wound to the subarachnoid space or the ventricle was the cause of the meningitis.

Of the 4 cases unaccounted for (3, 6, 8, and 9) 2 were admitted with cerebral abscesses (6 and 8), one (3) developed an abscess postoperatively in hospital, and in one case (9) an abscess was found at autopsy. One case (8) had a postoperative gas-containing abscess almost certainly associated with a mixed infection. The development of *Ps. pyocyanea* meningitis followed the change of packing on the seventh day after operative drainage of the abscess, and this may have disturbed [illegible] between abscess cavity and subarachnoid [illegible] It seems probable in this case that infection with [illegible]*yocyanea* was present from an early date. In case 6, [illegible]ple deep abscesses and subdural pus were producing [illegible]ebral herniation on admission. An incomplete operation had been done elsewhere. Meningitis developed the day after operation here and is attributed to infection present before admission.

Primary operation in case 3 was incomplete, for a large missile crossed the midline and a substantial amount of necrotic brain was inaccessible. Cultures taken from extruding brain before operation grew "coliform" organisms and *Staphylococcus aureus*. During convalescence the patient succeeded in reopening the wound. An indolent cerebral abscess developed and at operation the subarachnoid space was opened accidentally. Meningitis followed 2 days later. It is impossible to decide whether the organisms present on admission, or infection introduced when the wound was reopened is responsible for producing the brain abscess.

In case 9 the projectile had caused a long track of softened brain tissue, uninfected save in one area. From this focus of infection there had been extension through cerebral tissue directly into the ventricle. It is thought that in this case infection occurred early with later deep spread to the ventricle.

Group 2 includes the remaining 2 cases (10 and 11) for which an explanation of the meningitis is more difficult to establish. In one case (11) the patient showed evidence of a meningeal reaction on admission, and 7 days later, after evacuation of a subdural hygroma, developed full-blown meningitis. Autopsy failed to show a focus of subdural or intracerebral sepsis. It appears therefore that the meningitis may have been due to the lumbar intrathecal introduction of contaminated penicillin. This explanation also seems likely in case 10, in which a penetrating frontal wound was well walled off from the subarachnoid space and there was no communication with the ventricle or focus of deep sepsis.

DISCUSSION

Ps. pyocyanea is well recognised as a common secondary invader of open wounds in surgical wards. It may be found in soil and water and in the intestinal contents of man and animals. Hence it is a not uncommon contaminant of war wounds. Working at a base hospital, Ross and Magner (1944) found gram-negative organisms in 98 out of 365 cultures from wounds received in the Sicilian campaign. In half of these 98 cultures the infecting gram-negative organism was *Ps. pyocyanea*. The organism, being penicillin-resistant, may flourish in wounds, and in the subarachnoid space, from which gram-positive organisms have been eliminated by penicillin. In a series of 23 penetrating cerebral wounds reviewed by Cairns (1944), Scott Thomson found *Ps. pyocyanea* in 5 wounds before treatment and in 13 after a few days of treatment using local penicillin tubes. Cairns believed that "gram-negative pus" was harmless in brain wounds provided it had free exit from the wound, but he pointed out that final decision awaited further experience, since organisms of the coliform group were not necessarily harmless in CSF pathways, and if pus were to leak into the ventricle severe consequences might arise. The findings in our 11 cases provide a final decision. Cerebral wounds infected with *Ps. pyocyanea* cause meningitis if a communication exists with the subarachnoid space or the ventricular system even though adequate drainage to the exterior exists.

At the same time, evidence indicates that where complete debridement has been achieved cerebral tissue is resistant to infection with gram-negative organisms. Among 94 cases of penetrating cerebral wounds in which positive cultures were obtained, organisms of the coliform group were found in 25. These 25 patients received primary definitive surgical treatment at this hospital with complete closure of the wound. In 23 cases debridement was regarded as efficient and primary healing took place. In 1 case (case 7 of this series) infection of the subarachnoid space is believed to have occurred from infected temporal muscle. Incomplete debridement was carried out in the remaining case (case 3) and a postoperative cerebral abscess developed. The patient also reopened his wound.

Complete closure of the scalp in all cases of penetrating war wounds of the head is of great importance, especially when wards are filled with battle casualties. The use of a tube for instilling penicillin holds open a channel from the surface to the cerebral wound, and the surfaces of the tube provided a bridge along which organisms may spread. In 3 (nos. 1, 2, and 4) of the 6 cases (1, 2, 4, 5, 6, and 10) in this series in which a local penicillin tube was used, it has been judged the factor determining the intracranial spread of infection due to *Ps. pyocyanea*.

It is to be noted that 4 cases (nos. 1, 4, 5, and 10) had been incompletely operated on elsewhere, and on arrival required a second operation to complete debridement. This inevitably increases the risk of infection. Penetrating wounds involving the brain should be operated on but once and then completely and with closure of the wound.

Penicillin was given intramuscularly before operation and for approximately a week thereafter in all cases of penetrating wounds, with a booster dose during operation. It is believed, though no specific proof is available, that the blood-brain barrier is damaged by a cerebral wound or by operation, and that penicillin in the blood does gain access to the cerebral wound.

In addition to penicillin therapy all patients received 1–3 g. of sulphadiazine on admission to hospital and 1 g. every 4 hours thereafter for 6–10 days or until it was considered that risk of infection had passed. In the group of cases under discussion larger dosage of sulphadiazine and sulphapyridine produced no apparent effect on the progress of the meningitis in 9 cases. On the suggestion of Captain L. L. Bernstein, a member of the neurosurgical staff, 3 cases received in addition repeated injections of sodium iodide intravenously. One patient died after a protracted course. Two patients recovered and were the only survivors. Whether their recovery is to be related to the treatment administered is not known.

The available evidence does not allow definite conclusions to be drawn on bacteriological grounds as to whether or not contaminated penicillin was used. It seems reasonably certain that penicillin was sterile on issue from the laboratory, but during the period in which these cases developed the dregs in the bottles were not cultured on return from the ward. However, in 2 cases, as recorded above, it is believed on clinical and pathological evidence that the intrathecal injection of contaminated penicillin might have been the source of the meningitis.

SUMMARY AND CONCLUSIONS

A series of 11 cases of meningitis due to *Ps. pyocyanea*, with 9 deaths, is discussed with special reference to the pathogenesis. In 9 cases it is believed that infection of the cerebral wound spread to the subarachnoid space or ventricular system. The other 2 cases are thought to have developed meningitis as a result of the introduction into the lumbar theca of penicillin contaminated with *Ps. pyocyanea*.

Of the first 9 cases, 4 were secondary to brain abscess, and it seems likely that *Ps. pyocyanea* was present before admission in 3. The fourth case showed coliform organ-

subarachnoid space. The source of infection in 4 cases seems to be cross-infection in hospital, and this is attributed in 3 cases to leaving a tube in the wound for the repeated instillation of penicillin.

The risk of *Ps. pyocyanea* meningitis is minimised by

treatment of meningitis; in prophylaxis it should be used with caution. For intrathecal use penicillin should be issued in bottles containing only sufficient solution for a single injection.

This experience supports previous pleas for the observation of all possible precautions to prevent cross-infection in hospital.

Some of the bacteriological and pathological studies were carried out by Major J. P. Wyatt, RCAMC, and Major Stanley Hartroft, RCAMC.

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INFECTION FROM SPINAL ANALGESIA

A WARNING

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RECENTLY there have been two unfortunate instances of sepsis following spinal analgesia, both of which re-

before use. In each case the patient's back was prepared in the usual way with spirit and iodine.

A preliminary injection of 'Novocain' was given, the novocain being taken from a rubber-capped bottle, the top of which was removed to allow of ease in filling the syringe. The syringe used was the same 2 c.cm. Record syringe which was employed for the injection of the spinal anæsthetic ('Nupercaine'). Both patients subsequently developed meningitis. The cerebrospinal fluid was found to be turbid and to contain large numbers of polymorphonuclear pus cells. Stained films showed gram-negative bacilli in large quantities. Culture yielded a profuse growth of
pyocyanea had recently been
hospital, and the question aro
had occurred.

Sometime previously *Ps. pyocyanea* had been discovered in a specimen of cerebrospinal fluid sent for pathological investigation from another patient who showed no signs of meningitis. On this occasion the *Ps. pyocyanea* was eventually traced to the "sterile" distilled water, which was kept in a winchester. But where had the infection come from in these two particular cases? It was deemed possible that it was again a matter of the so-called sterile distilled water being used; but the sister had in fact put out cold sterile saline which was sterilised by means of steam which ran round a coil inside the container.

Cultures taken from the tap of the saline container
Ps. pyocyanea.
d to be sterile,
been in spirit
iscovered. In
addition an
the same batch
was culture
e sterile. The
ampoules of
2000 biniodide
eans
d in
as
Hewer and Garrod[1] have pointed out, contamination is unlikely.

Unfortunately it was not possible to make cultures from the novocain solution, because the remainder of this had been thrown away. It may be that this solution was already contaminated by a syringe which had been rinsed out in water infected with *Ps. pyocyanea*. This, however, is mere conjecture.

we
for

Sterilisation of apparatus.—All spinal syringes and needles should be boiled for at least five minutes. The syringes should be kept in spirit and be used solely for spinal analgesia, being taken from the spirit and *boiled before and after use.* Since there is some risk of syringes cracking during the process of boiling, it is wiser to use an all-glass syringe if possible. If, however, Record syringes are preferred, these should be taken apart, wrapped in gauze, placed in warm water and brought up to the boil. It is sometimes said that heat blunts the points of the needles, but we have not found this to be so if the needles are fitted with a guard made of rubber tubing, which is a little longer than the needle itself, so that the point is protected.

Ampoules of nupercaine should be kept in biniodide, and when taken out for use should be placed in a sterile kidney bowl on the trolley so that the ampoule may be picked up in a piece of gauze, thus ensuring that the anæsthetist does not actually touch the ampoule itself.

Novocain for local anæsthesia should also be taken from an ampoule opened at the time of use, observing all the precautions already detailed.

The skin should be prepared with spirit followed by iodine

skin may be used with advantage.

The trolley should be freshly laid out with sterile towels, galley pots, &c. The needles and syringes may be rinsed with sterile distilled water, but the bottle of sterile distilled water should always be opened freshly for the particular occasion, the remaining contents being subsequently discarded. We now use special 100 c.cm. bottles of sterilised distilled water which are easily obtainable.

If all these precautions are duly observed there should be no risk of introducing sepsis into the spinal theca.

SUMMARY

Two fatal cases of *Ps. pyocyanea* meningitis following spinal analgesia are recorded.

Recommendations for the sterilisation of syringes and needles by boiling are given in detail.

It is suggested that the local anæsthetic agent should be taken from an ampoule opened for the occasion, and that sterilised distilled water should be used, this also being taken from a bottle opened

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[1] *Brit. med. J.* 1942, i, 306.

VENOUS THROMBOSIS FOLLOWING PENTOTHAL ANÆSTHESIA

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LATE ANÆSTHETICS REGISTRAR, ROYAL FREE HOSPITAL, LONDON

THE following case illustrates a local effect of pentothal anæsthesia when associated with venous stasis.

A woman, aged 53, a poor anæsthetic and surgical risk, was admitted to the Royal Free Hospital for a left nephrectomy, and it was decided to operate under cyclopropane anæsthesia. 'Omnopon' gr. 1/3 and scopolamine gr. 1/150 was given preoperatively, and on arrival in the theatre she was placed on her right side with a pillow under her head. It was decided to anæsthetise her in that position. After induction with 0·5 gramme of 'Pentothal sodium' in 10 c.cm. of water, slowly given into the right median basilic vein, her hand was placed under her right cheek, thus flexing her elbow to about 20°. Anæsthesia was continued under a fairly light cyclopropane/oxygen mixture and at no time was there any anxiety as to her condition. The operation took about 45 minutes. Next day I was asked to see her. She was propped up in bed and a little cyanosed. She complained that her right forearm felt tight and there was fairly severe œdema from the antecubital fossa downwards. The median cephalic and basilic veins could be palpated and felt thrombosed; the radial pulse was palpable and there were no signs of extravasation of blood. Her general condition deteriorated following right heart-failure and she died the 4th day after operation.

At necropsy the arm was still as œdematous as it had been since the second day after operation. The clinical diagnosis was confirmed by the pathologist, who kindly allowed me to dissect out the veins of the arm. Most of the superficial and deep veins of the forearm had thrombosed. There were no signs of sepsis or extravasation around the site of injection. It was concluded that the œdema was due to some degree of "backflow" of pentothal and stasis resulting from the acute flexion of the forearm associated with a poor venous return.

My thanks are due to Miss K. Lewis, surgeon to the Royal Free Hospital, for permission to record the case.

Reviews of Books

Mental Abnormality and Crime

Edited by L. RADZINOWICZ, LLD CRACOW & ROME, J. W. C. TURNER, LLB CAMB., from the department of criminal science, University of Cambridge. (Macmillan. Pp. 316. 18*s.*)

THIS second volume of the *English Studies in Criminal Science* is an important collection of essays by experts [illegible] many fields. Dr. Angus MacNiven considers criminal [illegible] lation to the McNaghten rules. The [illegible] of the law is so liberal and humane, [illegible]lieves, that the defence of "uncontrollable impulse" [illegible] undesirable and unnecessary—a view supported by the experience of prison psychiatrists. Dr. MacNiven considers that anyone criticising the criteria of responsibility laid down in the McNaghten rules is faced with the almost insuperable difficulty of deciding on the precise meaning of the terms used; but Lord Reading, in 1916, explained these terms in simple and direct language which dispelled the fog. The criteria to be applied in arriving at the conclusion that the accused is "unfit to plead" may well find a place in this section in future editions; official figures show that in England and Wales their number is not far short of those found "guilty but insane." It is worth noting that the number found to be insane in the magistrates' courts, and there dealt with according to ordinary standards of certifiable insanity, is more than five times greater than the number dealt with in the higher criminal courts and found unfit to plead, or guilty but insane. Dr. W. Norwood East, in a chapter on physical factors and criminal behaviour, insists that theories of the association of physique and character should be applied in the field of criminology with extreme caution; and recalls that it may be difficult to decide in an individual case whether the physical or mental condition of an offender has been predominant in causing a criminal act. Other important contributions deal with alcoholism, juvenile delinquency, and Service problems.

Advances directed towards the rehabilitation of offenders have been introduced by modern legislation and modern prison administration. A scientific approach to mental abnormality and crime must be our future aim. Many essays in the book bear on this point and will prove valuable to lawyers, doctors, and workers in the social and moral sciences.

Hipertension Arterial Nefrogena

E. BRAUN-MENENDEZ, J. C. FASCIOLO, L. F. LELOIR, J. M. MUÑOZ, A. C. TAQUINI. (Libreria y Editorial 'El Ateneo.' Pp. 475.)

THE Argentine school of medicine have been in the forefront of the mass attack on the problem of hypertension, and in this volume provide a critical survey of our present knowledge. They concentrate on the problem of hypertension of renal origin, though they also consider essential hypertension. Experimental and clinical investigations, and methods of treatment are all reviewed with discrimination, though naturally the rôle of renal ischæmia and renin dominates the work. The bibliography is an example of the thoroughness which characterises the book: it contains over 1100 references and is international in outlook. Clinician and physiologist will find it an essential reference work for many years to come. It deserves an English translation.

Social Service in a General Hospital

DOROTHY MANCHÉE, head almoner of St. Mary's Hospital, London. (Baillière. Pp. 164. 6*s.*)

THIS little manual, compiled primarily for almoner students, contains much concise detail. The fundamentals of medicosocial work, simply explained, lead naturally to a study of the working of an almoner's department in a general hospital. Diagnosis of the patient's need is made at the first interview, and medical notes and consultations with the doctor help the almoner to form a plan for each patient. She must be fully aware of existing services in the community and use them. The word "Watch" on a case-paper means that almoner and patient keep in touch all the time, and much valuable information may be passed on to the doctor in this way.

The almoner is one of a team, complementary with the doctor and nursing staff, and Miss Manchée shows how doctors could make more use of the almoner's department in hospital. She writes with humour and tells good anecdotes. If the detail seems profuse and elementary to the doctor reader it will not seem so to medical or almoner students. Diagrams and tables illustrate the text.

Endocrine Man

L. R. BROSTER, FRCS. (Heinemann. Pp. 144. 12*s.* 6*d.*)

THE title of Mr. Broster's essay suggests a greater breadth of treatment than he has in fact attempted. The emphasis is laid almost exclusively on the adrenogenital syndrome and the book is largely a summary of his own well-known work. To sum up the subject of evolution in a few pages is a task at which anyone might baulk, and though Mr. Broster's brave attempt is readable, its relevance to the main theme, like that of the final chapters on symbiosis and parasitism and the nature of man, is somewhat tenuous. He has some pleasant flights of speculation. The witches in Macbeth may well have been examples of adrenal virilism; but perhaps it is stretching things a little far to suggest that Julius Cæsar had Cushing's syndrome in mind, when he expressed his preference for obesity.

Regional Analgesia

H. W. L. MOLESWORTH, FRCS, senior surgeon, Royal Victoria Hospital, Folkestone. (Lewis. Pp. 90. 8*s.* 6*d.*)

THE quality of this little book could be more uniform. It opens with a really helpful chapter on general principles. It is true that for success with local anæsthesia the patient, surgeon, and anæsthetist should be in the right frame of mind, and that spectators, too, have their part to play. There are good sections on care of needles, overdose of local anæsthetics, and choice of anæsthetic. But it is a pity that, after pointing out that 'Percaine' has been confused with procaine with disastrous results, Mr. Molesworth should refer to 'Percaine' throughout the text, and only thrice use the correct name of 'Nupercaine,' deliberately adopted by the makers to avoid this dangerous confusion.

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Gingivitis—evidence of dietary influence

In an exhaustive survey as to the incidence of Gingivitis in the R.A.F.[1] the following significant remarks occur:—

> "The figures . . . show that there is a correlation between the incidence of gingivitis and pre-Service social status, the condition being less prevalent in the higher-income groups. It is beyond the scope of this paper to discuss the reason for this, but both dietetic factors and differences in personal hygiene may be involved."

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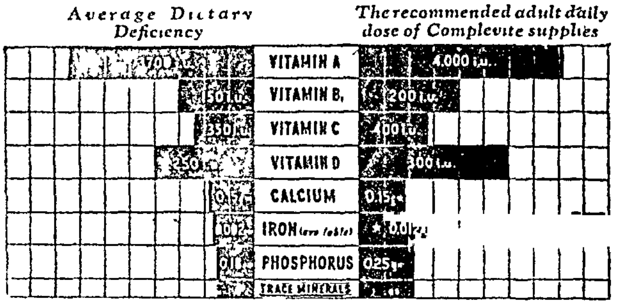

*The iron in Complevite exceeds the calculated deficiency expressly to combat the nutritional anaemia so common in children and in women of child-bearing age.

[1] *B M J* 1944, 2, 244 [2] *Brit Dental J.* 1942, 73, 47.

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1. *Amer. J. Digest Dis.* 1940, 7, 24.

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Copper	0.45 mg
Protein	30%
Available Carbohydrate	39%
Fibre	2%
Calorific Value	104

THE LANCET

LONDON: SATURDAY, JANUARY 27, 1945

An Academy of Medicine

THE profession is invited to consider two ventures in post-war medical development which have nothing to do with the white-paper on a National Health Service. Both have been mooted under the title of An Academy of Medicine. The first is the gathering together of the buildings of the Royal Colleges of Physicians, Surgeons, and Obstetricians, along with the headquarters of many of the larger specialties; for which purpose the surgeons propose their site in Lincoln's Inn Fields.[1] On this plan the academy would presumably be formed by the voluntary association of its constituent bodies, each retaining its identity and independence, and all sharing a common meeting-house. The second proposal is the much more ambitious one sketched by Sir STEWART DUKE-ELDER in our columns two years ago.[2] His academy would be "a corporation with a statutory basis, of compact size, authoritatively selected, and wholly divorced from politics. It should be supported by and work intimately with the State, be affiliated to the Privy Council, and thus responsible through a minister to Parliament." He places under it half a dozen councils: a Council of Civil and Social Medicine; an Imperial Medical Council; an International Medical Council; the Medical Research Council; a group of Professional Councils (including the Royal Colleges); and a Council of Medical Education, whose postgraduate hospital in London would stand in the same relation to the teaching hospitals as these do to their associated sector hospitals. The functions he allots to these councils are some advisory and some executive. Sir STEWART has now commended[3] association of the three Royal Colleges in Lincoln's Inn Fields as a first step towards the creation of the statutory academy he has in mind

The assumption that the first proposal is an instalment of the second may be too readily accepted. An examination of the purpose in view, and of the likelihood that the suggested organisation will serve that purpose, should come first. The object of Sir STEWART'S academy is threefold: to advise the State, with a single authoritative voice, on how it should direct and administer its medical services; to establish British medicine, in place of German, as a leading cultural and political influence in post-war Europe; and to be the channel of medicine's contribution to the invigoration of our own national life. Are these functions best served by bodies under government control or by bodies independent of government? The advice [illegible] be purely professional [illegible] considerations out of account; but Sir STEWART'S academy, subvented by large sums of government money, and designed as a pyramidal structure with a minister at its apex, might be subject to political and bureaucratic influence. Situations might even arise where the only way to elicit a "single authoritative voice" from medicine would be to exert pressure on it from above. The leadership of European medicine is a worthy aim, but it should be sought for its own sake, not as support to British political influence abroad; and it should rest on the excellence of British medicine, not on the strength of government-sponsored salesmanship. The zeal of medicine in the national peace effort might be sapped if all its professional bodies were over-organised under high direction. To these doubts it may be objected that Sir STEWART'S academy is to be affiliated with the Privy Council, as distinct from a ministerial department, and is to be "wholly divorced from politics"; and the present Medical Research Council may be quoted as an example of a professional body enjoying both freedom and government finance. But the MRC's annual quarter of a million is a small sum. The academy would need many times that, and as an organisation and its cost grow large, government control is liable to become more close and detailed. The international rôle of the academy is a particularly delicate one. Sir STEWART almost admits that its chief aim may become political, when he urges that British influence should replace that of Berlin, which "was exploited for political ends." Such exploitation of British medicine might prove tempting to a [illegible] control of most of the [illegible] moment the profession [illegible] government and the country on its foreign policy this may not always be so.

With socialisation, and its almost inevitable instrument, bureaucracy, steadily and quietly transforming the structure of our society, it is well to distinguish those functions of society well served by socialism from those that are hampered by its cumbrous and uniform machinery. Among the former are mechanical offices, like delivering letters or making munitions, and in general all large tasks which can be simply and precisely formulated in advance. Among the latter are most of the activities of man which we call cultural or creative. For these the utmost freedom of individuals [illegible] freedom of [illegible] They cann[illegible] task of medicine is neither purely mechanical and computable, nor purely creative. It is something of each. So while it may be proper that its routine work should be tied up in an organised health service—albeit with pink elastic rather than with red tape—it is essential that its philosophy and its search for truth should be free, and that the bodies that give expression to these should be independent. The principle is easily stated; but putting it into practice requires money; and, with the levelling of incomes that socialism involves, independent financial support for the "higher" activities of the human spirit shrinks: already the State supports art galleries, though not yet opera-houses. It is a problem of the socialised State that it must find ways of paying for these things, without exercising close control; for close control is the expression of the average mind, and these are the activities of the gifted. As things are, it had better pay smaller sums to chosen bodies and trust them with the spending, rather than organise a ministry of fine arts or a government Academy of Medicine.

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[1] *Lancet*, 1944, ii, 605.
[2] *Ibid*, 1942, ii, 686
[3] *Times*, Jan. 10, p 6

For most of the objects Sir Stewart Duke-Elder has in view, the Royal Colleges, by virtues of their tradition and their independence, are bodies well suited to the task. In research they can play a part complementary to that of the universities and the hospitals. In some degree they are perhaps too narrowly centred on London; a reorganisation of the equivalent bodies in Scotland into one or two Scottish colleges would do much to compensate for that. In presenting British medicine to the world, they are handicapped by their isolation and the inadequacy of their buildings. Undoubtedly their own life and their wider contribution would be enriched by rehousing them in propinquity, and it will be a disappointment and a missed opportunity if the Lincoln's Inn Fields plan, or a better, does not materalise. If Government support is necessary it might be given as payment for services rendered in connexion with higher qualifications and their examinations. And if the group of colleges take for themselves the name Academy, they should do so as a free association of independent bodies, cooperating for their own and their common ends, after a fashion already familiar in the British Commonwealth of Nations.

Keep Moving Please

We are all familiar with the patient after an abdominal operation who lies painfully still, fearing to move limb or muscle. And with his joy when he is told: "You can move about, run if you like—there isn't the slightest risk of your bursting." We are largely to blame for his over-cautious attitude, for we do not always impress on the nursing staff the importance of encouraging early movements; from his first awakening from the anæsthetic the patient hears the nurse calling on him to keep still. It is a pity that in many hospitals the surgical nursing lectures and the orders for postoperative treatment are the tasks of junior house-officers, and the surgeon is rarely invited to talk to the nurses. Rowlands of Guy's used to tell his patients, with assumed dignity, "I confer on you the freedom of the bed," and it went down well. Early movement is one of our most powerful counter-measures against pulmonary embolism or massive collapse of the lung. Its local value we also know; the muscle contraction calls for and brings more blood, while the squeezing of lymphatics scavenges debris and prevents the stagnation and organisation of pools of lymph glue.

We know that the moving face muscles heal well; so does the tongue, and so does the ever-moving chest wall. We have not so much faith in the abdominal wall. Yet many surgeons get their patients after simple abdominal operations out of bed by the 4th day, and one at least insists that his abdomino-perineals meet him in the corridor by the 7th day. Particularly in America[1] there is a trend to get patients up even earlier—walking within the first 24 hours after operation—the contention being that the 3rd day is too late if lung complications or venous thrombosis are to be avoided. Nelson[2] has reported on 426 abdominal operations treated by early ambulation, and has been impressed by their more rapid and smooth convalescence. Within a few hours of the operation he asks them to walk to the bathroom (no-one is unduly urged to do this); they then sit up in a chair for a time before returning to bed. The abdominal wound hurts slightly at first, but with further movement becomes less painful. Most surgeons will agree with this observation, and undoubtedly the "moving" patient is rarely troubled by painful stitches. Nelson also points out that, despite their bawlings and struggles, wound disruption is almost unknown after operations on infants; and in animals, even with their vigorous movements, experimental wounds heal firmly. But catgut was not used at any of Nelson's operations; indeed he recommends that only if cotton or nylon has been used should early ambulation be allowed. Localio, Casale, and Hinton[3] have shown experimentally that the tensile strength of a wound sutured with catgut is at its weakest on the 3rd or 4th day, and Mason[4] maintains that any motion during this lag period will stretch the forming scar. With cotton, nylon, or wire the minimal strength of the wound is at all times far above that with catgut. In Britain catgut is still on the whole favoured, although there is a growing tendency to use non-absorbable suture material. Such very early rising may for this reason—and others too—not be advisable after abdominal section, at any rate in this country. Moreover, Nelson's figures indicate that 317 out of his 426 abdominal operations were appendicectomies, although the 79 hernia wounds healed well, the follow-up results are not described, and these are the real test. The appendicectomy wound is usually valvular and does not necessitate a long convalescence. South Africans will recall an international rugger match where the New Zealand full back played [illegible] weeks after an emergency appendicectomy (and he had done some training first). But to get a soldier fit for duty takes longer. Dively[5] found that after appendicectomy an average of 61 days' rehabilitation was needed for the US soldier to be able to march 17 miles a day with full kit.

Our attitude towards head injuries too has changed in recent years. We no longer insist that the patient with concussion or a fractured skull must lie still in a room with drawn blinds and darkened lamps, while all around, with tiptoe and whispering, gloomy faces tell him to keep quite still. That is a sure way to convince him that his brain has been damaged, that he will be abnormal and unable to compete fully in his future life. Emphasis is now laid on the near-certainty that there will be no permanent damage—he is got out of bed early, rapidly rehabilitated, and by trial brought back to normal life. If he gets headaches or dizziness he may be put back temporarily, but only for a day or so. How satisfactory this may be is shown by Cade's[6] extensive experience of head injuries in the Royal Air Force. He has enunciated a new all-or-none law: "If a case of head injury escapes death, the injury is such that return to full flying duties can confidently be anticipated."

There are two important contra-indications to very early movement after operation—when infection is present or likely, and when the tissues are ischæmic (and in that may be included tissues under tension). To move infected tissue is to squeeze and spread the infection in the lymphatics; that TRUETA and BARNES[7] have proved. To move ischæmic tissues is to increase the local metabolism and add to the calls on the trickling oxygen stream. But there is a definite advantage in moving such ischæmic tissues once the ischæmic crisis has been tided over;—movement at this stage will call on and force more rapid building up of the collateral vessels.

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[1] Neuberger, B. *Surgery*, 1943, 14, 142.

[2] Nelson, H. *Arch. Surg.* 1944, 49, 1.

[3] Localio, S. A., Casale, W., Hinton, J. W. *Surg. Gynec Obst.* 1943, 77, 376. *Ibid* (*Int. Abstr Surg*), p. 369.

[4] Mason, M. L. *Ibid*, 1939, 69, 303.

[5] British Orthopædic Association meeting, London, Dec 15, 1944

[6] Cade, S. *Brit. J. Surg* 1944, 32, 12.

Apart from such definite contra-indications, we must ask ourselves whether this drive for early active movements may encourage irresponsible over-enthusiasm. Whether it may foster ankylophobia and bring us back again to the days of LUCAS-CHAMPIONNIÈRE. Undoubtedly there is such risk. We need to ask ourselves also whether we may be jettisoning the fundamental principle of rest for the healing tissues. But, as JEAN PIERRE DAVID wrote nearly 170 years ago, "absolute rest is an imaginary thing"; no splint immobilises absolutely. THOMAS refused to use plaster because he thought it might constrict the circulation. We now know that the well-applied plaster does not do this, and that beneath that plaster the muscles still contract and glide within their sheaths. WATSON-JONES has done much to urge the importance of muscle contraction for the immobilised bone or joint injury He has stressed that muscle contraction within a plaster cast accelerates the circulation of blood and of lymph; thus stasis is prevented, and stiffness of the immobilised joints is avoided. To move the fingers is to ensure that the immobilised wrist will not become stiff; to activate the muscles of the lower limb will prevent stiffness of the knee or ankle. It is important however to differentiate between muscle and joint movement. It is generally agreed that to move the joints contiguous to a fracture or wound is to risk tearing the frail healing tissues It is no argument that healing may still take place, for we know that "nature will work out its rights some way or other through the worst sophistication." The healthy immobilised joint, despite long immobilisation, will not become irreparably stiff if muscle contraction has been attended to. "Action is life" was CHAMPIONNIÈRE's slogan, but it holds true for the muscles only.

Passive movements are to be condemned. They will not stimulate the muscles; they may tear and lead to further scarring, myositis ossificans, and secondary nerve lesions. Only when there is a nerve lesion or an ischæmic palsy should passive movement be allowed. Tissues that have been disrupted, especially in gunshot injuries, are apt to become tethered and adherent to surrounding structures, but the temptation to free them by passive stretching must be resisted. The patient needs to have explained to him that "if there is a little movement, nature will soon make it a little more." Minimal movements soon become major under the stimulus of necessity. But freedom of movement, like other freedoms, has to be worked and fought for—and it all depends on the patient. We need to impress on him that "skill to do comes with the doing."

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[7] Barnes, J. M., Trueta, J. *Lancet*, 1941, i, 623.

Trends in Treatment of Burns

AFTER five years of war in which burns have been very common, there is still no general agreement about their treatment. The surgeon with experience of these injuries before the war may well be surprised at the sudden and drastic condemnation of the coagulation methods formerly approved. Though locally it may kill epithelial cells, and if absorbed it damages the liver, tannic acid has not been abandoned primarily for these reasons, but because better means of treatment have been evolved. The replacement of coagulation therapy has been hastened by its unsuitability to conditions of active service. To some extent changes in method have been the result of experimental work in the laboratory which has thrown more light on the essential lesion of a burn. This aspect is ably reviewed by GLENN.[1]

That a true toxæmia exists in the early stages of a severe burn is still fairly widely accepted. Often there is an otherwise unexplained pyrexia at a time before infection has become established, and interference with the function of the liver has been detected in cases where tannic acid has not been used. The "toxin," presumably a product of the damaged tissues, remains unidentified. Recently a new globulin fraction has been found in the lymph from a burnt area; and this lymph also contains a substance that will stimulate the respiration of liver slices in vitro.[2] If either of these is a toxin then it will obviously be an advantage to restrict the flow of lymph from a burn as much as possible. Production of lymph is always excessive because of the greatly increased permeability of the blood capillaries. Exposure to temperatures of 55° C or above results in an irreversible change in the walls of the capillaries, rendering them permeable to blood-plasma.[3] Fluid is lost into the tissues round the burn, and part of it may escape from the raw surface. It was the loss of this latter fraction that could be prevented by tanning, but whether retention of this fluid that had already left the circulation was of much value is questionable. The fact that capillary permeability remains increased for a number of days must be borne in mind. Fluid and protein loss may readily be restored by plasma transfusions, but little is gained if the extra fluid is allowed to escape immediately into the tissues. Excessive distension of the tissues will take place, and this, as GLENN points out, may interfere with the nutrition of the surviving surface tissues and also induce pain.

To control this capillary exudation the application of pressure dressings has become increasingly popular in America. The use of these dressings has recently been redescribed by their originator, SUMNER KOCH.[4] A simple bland dressing is applied to the burn and this is firmly bandaged over a thick layer of mechanic's cotton-waste. The dressings are changed at intervals of ten days or more. Unfortunately it is difficult to control the pressure when applying a dressing of this type, especially if it is being done in a hurry. Too little pressure is useless, while too much may be disastrous. An alternative method of controlling exudation is enclosure in plaster-of-paris casts.

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[1] Glenn, W. W. L. *Ann. Surg* 1944, 119, 801.
[2] Muus, J. Hardenbergh, E. *J. biol. Chem.* 1944, 152, 1.
[3] McCarrell, J. *Amer. J. Physiol.* 1940, 128, 349
[4] Koch, S. *J. Amer. med. Ass*, 1944, 125, 612.

When these are applied early, swelling continues inside them until the pressure exerted by the tissues on the wall of the cast equals that of the fluid inside the capillaries. When this stage is reached no more fluid escapes from the vessels. Experimentally it has been shown that under these conditions of equilibrium inside a cast the circulation is completely satisfactory.[5] Supporting this is the successful use of plaster casts in the treatment of burns. As **Glenn** has insisted, *no pressure* must be exerted when the cast is being put on: the natural tendency to apply any bandage tightly may well explain a number of disasters due to ischæmia inside plaster casts in other types of injury. Apart from its value in reducing the amount of fluid lost from the circulation, the prevention of œdema reduces the chances of fibrosis and subsequent stiffness round the lesion. **Levenson** and **Lund**[6] agree with earlier users of plaster casts that immobilisation per se is not a cause of stiffness.

The dangers of infection remain serious despite advances in chemotherapy. The value of the initial cleansing of a fresh burn remains in doubt, but infection comes all too easily as a sequel to changes of dressings in hospitals. The technique of dressing wounds has been much improved, but is far from foolproof. The Royal Air Force[7] still advocate a method of treatment involving daily change of dressings. Though this may not be risky when carried out in special burn centres, it remains true that the less often a dressing is changed the more time there is to devote proper care and attention to the operation, and the fewer the opportunities for infection. **Gurd** and **Gerrie**,[8] in a useful review of skin-grafting in these cases, assume the changes of dressing to be relatively infrequent, and say that on each occasion preparation should be made for carrying out a graft if conditions are found suitable. By this means raw areas are covered at the earliest opportunity, and the time taken for a deep burn to heal becomes a matter of weeks rather than months.

The general condition of a burnt patient must be watched with particular care. Apart from conditions demanding blood-transfusion there is a pronounced katabolism of protein, starting soon after the injury, and the amount of nitrogen lost in the urine may be the equivalent of as much as four times the normal daily protein intake of the patient.[9] Further protein may be lost from the surface of the burns in the exudate: the nitrogen equivalent of this may be as high as a quarter of the total being lost in the urine.[10] To replace all this protein may be impossible in a sick man, but a diet with high protein content is obviously called for until healing is well advanced.

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5. Glenn, W. W. L., Gilbert, H. H., Drinker, C. K. *J. clin. Invest.* 1943, **22**, 609.
6. Levenson, S. M., Lund, C. C. *J. Amer. med. Ass.* 1943, **123**, 272.
7. Air Ministry pamphlet 168, First Aid and Early Treatment of Burns, 1944.
8. Gurd, F. B., Gerrie, J. W. *J. Amer. med. Ass.* 1944, **125**, 616.
9. Taylor, F. H. L. et al. *Ann. Surg.* 1943, **118**, 215.
10. Hirschfield, J. W., Williams, H. H., Abbott, W. E., Heller, C. G., Pilling, M. A. *Surgery*, 1944, **15**, 766.

On Thursday, Feb. 1, at 3 P.M., Mr. W. S. Morrison, Minister of Town and Country Planning, will open an exhibition of plans and models of the scheme for the reconstruction of Bath which has been prepared for the Bath and district joint planning committee by Sir Patrick Abercrombie and the city engineer and planning officer.

Annotations

GOVERNMENT AND GOODENOUGH REPORT

On another page we print a statement by the Ministe of Health on the Goodenough Committee's programm for reform and development of medical education. Th Government have recognised the principle that large grants will be needed for medical education and research The additional funds will be distributed by the Universit Grants Committee, through the universities, to th medical schools, postgraduate institutes, and hospitals i which teaching and research are carried on, and for time these additional grants will be separated from th block grants received by the universities for their worl as a whole. The decision of the Government that futur payments of grants to medical schools will be contingen on their admitting a reasonable proportion of students o both sexes should lessen the difficulty of securing place in hospital now experienced by women students, especially in London. The Government realise that it ma take time for some of the schools which at present accep only men to provide accommodation suitable for women and suggest that the University Grants Committee, in consultation with university authorities, should decide whether reasonable action is being taken by the schools to meet this requirement. Increase of grants will also depend on revision of the curriculum, and Mr. Willink expressed the satisfaction of the Government on learning that the General Medical Council is already moving towards reform. The amounts of grants to be made, whether for capital or recurrent expenditure, will be decided according to the recommendations of the University Grants Committee, and the finances of the country at the time.

PERLÈCHE

First described in 1885, the fissuring inflammation of the oral commissures called perlèche has come again int prominence in recent years as a possible indication nutritional deficiency. But Finnerud[1] now throws doubt on any specific significance of the lesion and suggests that it is merely "a cutaneous symptom occurring in the form of an intertrigo of the labial commissures analogous to intertrigo elsewhere and of manifold ætiology." Lemaistre, who originally described perlèche and derived the word from the French *pourlècher*, to lick (one's lips), favoured an infective cause, and subsequent writers have implicated many organisms. Finnerud, who himself favoured the possibility of a monili infection some years ago, is now more inclined to conclude that systemic and local factors prepare the soil before any infective element comes into the story. Among local factors must be considered those of dental origin, such as malocclusion from ill-fitting dentures, and possibly, though Finnerud does not include this, the leaving out of dentures at night, allowing so much overlap of the lips as to lead to a constant maceration at the corners Perlèche due to vitamin deficiency is well established on an experimental basis and in riboflavine deficiency fissure of the corners of the mouth undoubtedly do occur, ofte associated with cheilosis and changes in the tong Micro-organisms have been obtained from such lesion but quickly disappear as the lesions heal under treatment with riboflavine, brewer's yeast, or liver extract. But Finnerud's list does not end with infection, malocclusion, and vitamin deficiency. He includes an idiopath perlèche for which no adequate cause can be found, and under the heading "pseudoperlèche" he lists lesions of the corners of the mouth in cases of contact dermatitis, neurodermatitis, seborrhœic dermatitis, atopic derm titis, severe "chapping," and herpes, to which he add the rhagades of congenital syphilis. Faced with such list the nutritional expert must obviously exercise caution

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1. Finnerud, C. W. *J. Amer. Med. Ass.* 1944, **126**, 737.

before he diagnoses riboflavine deficiency on the mouth-angle lesions alone. Probably Finnerud is right to suggest that the old name is best retained for a local condition which may arise in so many ways.

CUTTING THE APRON STRINGS

HUMAN young in a civilised community are animals of slow growth. Years are needed for the transition from the helpless creature in utero to the active adolescent. When physical union with the mother is severed the infant usually celebrates audibly the first independent use of his functions; but he takes many months and years to complete the physical and psychological weaning from his mother, only gradually asserting his increasing power to live by his own efforts and by his own wits. Ultimately the time is reached when he cuts the apron-strings, as once the midwife cut the navel-string for him. We know the right moment to cut the navel-string; and thereafter all child nurture and education is designed to help him to loosen the apron-strings. But do we know just when he should begin and just how fast he should go? We seem to be getting a little impatient with his slowness. Education Acts of the past have put 5 years as the age at which the child should take his first official step towards becoming a member of a social community in his own right. The Education Act of 1944 proposes that he should be widely encouraged to take that step at 2 years old. The popularity of war-time day nurseries (quite apart from the value they are believed to have to the war effort) suggests that many people think that he is ready even earlier for some degree of life on his own in a community.

What do we gain, or rather, what does the child gain, by this growing attempt to wean him from his mother and his home while still an infant? Greater confidence in himself perhaps, and a quicker development of bodily and mental powers? It is said that the stimulus of the company of others and a wider range of things to see and hear and use quicken the response; and the nursery-school teacher, trained to watch and learn from children, does not doubt that it is true. But children do not go to nursery schools until they are 2 or 3 years old. During the war we have drawn numbers of children under 2 into the community life of day nurseries, and many doctors and nurses have had a chance to learn how they respond. A letter in our correspondence columns notes that the Medical Women's Federation is attempting to gather some of this experience, as it relates to the children's physical health. Children in day nurseries catch infectious diseases, notifiable and other (indeed the non-notifiable respiratory infections seem the worst bugbear); but children not in nurseries catch infections too and we need to compare the incidence inside and outside nurseries. Information on this point will be really useful, and we commend the project to medical officers of health, whose coöperation is sought.

But physical health is only half the story. How does the child under 2 respond to the mental stimulus of community life? Is it in fact a stimulus to which he *can* respond—to which he is ready to respond? There seems little doubt about the response of the child of nursery-school age, but with the under-2's, and perhaps even the under-3's, we are on less sure ground. Often it seems that the child of this age does not want as yet to join with his fellows. Undeveloped, and still uncertain of his own individuality, he demands the security of adult attention to a degree impossible to provide under nursery conditions. It is not just physical attention that he wants, but that constant "awareness" of him which is the basis of his mother's relationship with him. Lack of it for some hours every day may put too great a strain on some children: but knowledge on this point is scanty and research difficult. Moreover, the personality of the child is also affected by the varying personalities of the nursery staff and the degree to which each, by virtue of her character or training, can meet his needs. The child's well-being, however, is linked with the mother's, and it may be said that constant awareness of the child is in itself a strain. This is an argument for part-time day nurseries, where young children may be placed for a day, or perhaps even a few hours, weekly, so that the mother may be relieved for a while of her responsibilities and return to them refreshed. A woman who has some opportunity to live her own life, not solely as a mother but as an individual, may make a better mother. Experiments with part-time nurseries should enlighten us.

Ps. PYOCYANEA MENINGITIS

MOST b[illegible] with the specimen of cerebrosp[illegible] if there has been delay in [illegible] laboratory, looks a little opalescent but is found to contain nothing abnormal except a pleomorphic gram-negative bacillus which is blithely reported as a contaminant. The frequency of such contaminations was illustrated by Smith and Smith[1] in their isolation of "coliform" bacilli, white staphylococci, diphtheroids, and non-hæmolytic streptococci in 40% of 223 specimens of cerebrospinal fluid. About a third of these contaminants were judged to come from the water used to rinse and immerse the sterile syringes and needles before spinal puncture. Such contaminating bacteria, apart from being an annoyance and sometimes a snare for the bacteriologist, probably do little or no harm where lumbar puncture is performed for the withdrawal of cerebrospinal fluid. It is altogether different if fluid is being injected intrathecally, as is done on a considerable scale with anæsthetics and lately with penicillin. Thus Barrie[2] reported 11 cases of low-grade meningitis with one death among 96 consecutive patients operated on under spinal anæsthesia. In that instance a defective filter used for the preparation of sterile water was probably to blame. Now in this issue Frankis Evans reports 2 fatal cases of *Ps. pyocyanea* meningitis following spinal anæsthesia. The source of the organism was not finally traced, but the needle used for lumbar puncture was stored in spirit, a poor disinfectant, and rinsed with "sterile" saline before use; and rinsing with so-called sterile saline or water is a likely mode of introducing bacterial contaminants. The practice of storing sterile saline or water in large winchester bottles is still too common in hospitals, and no matter how often these bottles are used the label "sterile" or even "distilled" is accepted by the nursing staff as sufficient security, although it is well known that sterile distilled water is easily contaminated.

On another page Botterell and Magner report 11 cases of *Ps. pyocyanea* meningitis—all but 2 of them fatal—from a Canadian neurosurgical unit. The infection in 2 cases was apparently attributable to the intrathecal injection of prophylactic penicillin. Although great care was taken in the preparation of penicillin solutions in the laboratory, and frequent cultures of dispensed samples were sterile, the dregs of two bottles used in the wards contained *Ps. pyocyanea*. In the remaining 9 cases infection was presumed to have spread from the head wound to the subarachnoid space with which it was in direct or close contact. Infection of the wound with *Ps. pyocyanea* was probably present in 3 cases before admission, and Botterell and Magner deprecate incomplete operative interference, unless it is unavoidable, before the patient is admitted to a special unit. Cerebral tissue, if debridement is complete, is relatively resistant to infection with gram-negative organisms, but "gram-negative pus" in brain wounds, even when there is free drainage, may be followed by fatal meningitis, and therefore every precaution must be taken to prevent its occurrence. In this Canadian unit the surgical no-touch

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1. Smith, W., Smith, M. M. *Lancet*, 1941, ii, 783.
2. Barrie, H. J. *Ibid*, 1941, i, 242.

technique, which in McKissock's experience has proved so successful in preventing infection of head-wounds, was adopted, but its faithful practice could not always be guaranteed in the face of overcrowded wards and overworked nurses, and Botterell and Magner attribute at least 4 of their pyocyanea infections to ward cross-infection. The risk of such a happening was greatly reduced when they gave up the local instillation of penicillin by rubber tube in favour of primary closure of the wound by suture, with penicillin systemically.

These tragic hospital infections are not isolated occurrences, and their courageous publication should be warning enough. The control of hospital infection concerns every member of the staff, and not least sister-tutors, to whom the instruction of nurses is nowadays largely left and whose teaching is sometimes a little out of date. The nature, sources, and mode of spread of hospital infection, admirably set out in MRC memoranda Nos. 6 and 11, need to be taught early in the nurse's training. It is a job that should primarily belong to the hospital bacteriologist.

HÆMOPTYSIS IN MITRAL STENOSIS

PROFUSE hæmoptysis is sometimes met with in mitral stenosis even when neither pulmonary infarction nor congestive heart-failure is present. Many explanations have been advanced for these cases—that the pulmonary congestion and hypertension accompanying mitral stenosis cause rupture of the pulmonary blood-vessels; that associated pulmonary arteriosclerosis weakens the pulmonary vessels; that the bleeding comes from sudden dilatation of the pulmonary capillaries with diapedesis into the alveoli. None of these suggestions is very convincing. Ferguson and his collaborators[1] now describe a method of injecting the bronchial veins, using a modification of the white-lead solution recommended by Schlesinger[2] for injecting the coronary vessels, whereby they claim to have demonstrated a direct venous connexion between the bronchial and pulmonary veins. They suggest that in mitral stenosis the veins in the submucosa of the larger bronchi dilate as a result of the collateral flow through them, and that rupture of these dilated veins leads to hæmoptysis.

Necropsy specimens from control cases without clinical or pathological evidence of mitral stenosis, from 6 cases of non-rheumatic heart-failure, and from 11 cases of mitral stenosis were investigated. The injection mass, introduced into the pulmonary veins at a pressure of 80 mm. Hg, was never seen in the pulmonary capillaries, nor did it appear in the bronchial or pulmonary arteries, but in all the cases, including the controls, it passed freely from the pulmonary to the bronchial veins. Of the cases of non-rheumatic heart-failure, 3 showed slight dilatation of veins in the larger bronchi. Pulmonary arteriosclerosis did not affect the flow through the bronchial veins, nor was it affected by age or hypertension without heart-failure. Six of the 11 cases of mitral stenosis showed definitely enlarged bronchial veins, and in 4 of these the venous dilatation was pronounced. Four of the 11 cases had a history of hæmoptysis, and 3 of these showed pronounced dilatation, the fourth being unsuitable for the demonstration of bronchial veins because of the presence of hæmorrhagic bronchitis. Hæmoptysis was associated with pulmonary infarction in only 1 case—one of those in which dilated bronchial veins were demonstrated.

Ferguson and his colleagues suggest that in mitral stenosis the flow to the left auricle through the pulmonary veins is hindered. As a result of the rise of pressure in these veins the venous anastomosis is reversed and blood passes from the pulmonary veins to the bronchial veins and thence to the right side of the heart. To cope with this extra strain the submucosal bronchial veins dilate and become varicose. Hæmoptysis is then due to rupture or ulceration of these veins, often precipitated by sudden alterations in pressure induced by a severe coughing bout, or a sudden rise in left auricular pressure such as may occur at the onset of auricular fibrillation. This may not be the whole story, but it fits in fairly well with current conceptions.

PREVENTION OF BLACKOUT

THE impairment of vision during active manœuvre in flight known as "blackout" was first observed clinically in this country when pilots of the Royal Air Force were practising for the Schneider Cup races in 1927. Blurring of vision and blindness were experienced in steep turns This blackout is the result of centrifugal force applied to the long axis of the body. The increased weight of the blood prevents the heart from maintaining the hydrostatic column between heart and head, and encourage *pooling in the lower limbs. The consequent fall of blood* pressure produces retinal ischæmia and so the blackout Continued [illegible] of centrifugal force leads to unconsciousness. [illegible] precedes loss of consciousness because the intraocular pressure causes the retina vessels to collapse while blood still flows through the brain

Since it is impossible to alter the increased weigh of the blood, measures to overcome blackout aim a decreasing the height of the hydrostatic column between heart and head, and at preventing blood from draining into the legs. In theory these objects could be obtained by assuming the prone position, but this is not normally practicable in flight. However, blackout threshold may be increased by crouching forward and raising the legs as the centrifugal force is applied. Cockpit design can do much to make this easy, and during the Battle of Britain pilots of the RAF obtained much benefit from crouching, tensing the abdominal muscles, and raising their feet on specially designed rudder pedals. Suits also have been developed *consisting of trousers of inextensible* material which reach up to the level of the heart Within these trousers are a series of carefully placed bladders. In one type the bladders are filled with water and this exerts an equal and opposite pressure on the vessels in the lower limbs when centrifugal force is applied. If an air suit is worn air is automatically pumped into the bladders when the centrifugal force has reached a certain level. Such suits must be sufficiently comfortable to be tolerated both in the air and on the ground when living in operational conditions. Work on many phases of this problem has been carried out by the Royal Air Force and related to each type of fighter aircraft as it is produced.

PRESERVATIVES IN FOOD

A CIRCULAR from the Ministry of Food relaxes some of the prohibitions of the Public Health (Preservatives &c. in Food) Regulations 1925. Its most important effect is to allow borax, a preservative which was totally prohibited, to be contained in margarine and bacon, two foods in which no preservative of any kind was allowed. Presumably this change in policy is necessitated by war-time difficulties in supply. There is of course no doubt that borax is a convenient means of keeping foods sweet and rendering marketable foods that have been damaged by decomposition. But its prohibition was based on strong objections to its use, and we trust that it will again be proscribed as soon as the food situation permits.

Before the regulations were relaxed, sulphur dioxide and benzoic acid were the only preservatives allowed in any food, and these could be added only in specified amounts to certain foods. Sulphur dioxide may now be used in meat and dried vegetables, and the permissible amount in jam has been raised from 40 to 100 parts per million. To this no serious exception can be taken. Our aim is to abolish preservatives of every description so as to ensure that foods are sold fresh: but where some preservative must be used, the one to which there is least objection is sulphur dioxide.

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1. Ferguson, F. C., Kobilak, R. E., Deitrick, J. E. *Amer. Heart J.* 1944, 28, 445.
2. Schlesinger, M. J. *Ibid*, 1938, 15, 528.

Special Articles

HOSPITAL FOOD

III.—WHAT SHOULD BE DONE?

> "[illegible] food revise—
> [illegible]d what its size !
> [illegible] mistake
> [illegible] trouble make."
>
> *Regimen Sanitatis* written in A.D. 1100 and quoted in Hutchison's *Food and the Principles of Dietetics*

NEW interests are prone to oust old ones. When the doctor's weapons were few he used all of them to the full, and diet was one of his most serious cares. Nowadays, with drugs multiplying like mice, and new methods of treatment claiming his attention almost daily, he is apt to forget the older lore in pursuit of the new.

Surgeons are specially liable to feel that food is not their province, for in peace-time, unless they specialise in orthopædics, they commonly deal with short-term cases. There is possibly some truth in the view that just [illegible] operation a patient must not, and just after it [illegible] eat anything, and that by the time he is [illegible]ngry again he is ready to go home. In war-time, however, most surgeons have long-term cases to treat, and need to remember that a man who must face a series of operations should be maintained in the best general health possible by an ample, nutritious, and appetising diet. If that sort of diet is not appearing on the patient's plate it is the job of the surgeon himself to see that it gets there.

[illegible] are often in hospital for [illegible] have an even more serious [illegible]. The words "full diet" or "light diet" on the bed-card will not work a conjuring trick by which the very meals the doctor had in mind arrive on a tray. Sometimes, if he is a young house-physician, he has no particular meals in mind. He knows that signing up the diet on the bed-card is part of the routine and he gives no thought to its implications. Senior physicians should pay surprise visits to the wards at dinner-time, if necessary braving the wrath of sisters, to see what [illegible]. But this should not [illegible]h sister dancing att[illegible]: they should go t[illegible] They should also induce their house-physicians to forgo their dinner once a week and take a patient's meal. If this does not produce some accurate and informed criticism, house-physicians are not what they were.

WHO SHOULD BE RESPONSIBLE?

In our previous articles we have noted the chief causes of bad hospital feeding. These may be summarised in order of importance as:

Lack of due conscience among the medical staff.
Divided responsibility for feeding.
Misplaced thrift.

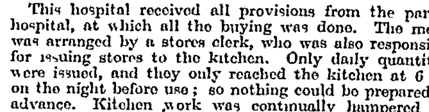
The *Memorandum on Hospital Diet*, published by King Edward's Hospital Fund for London in 1943, recommended that catering—including all processes relating to planning, buying, preparing, and serving the diet—should be regarded as a main department of a hospital; and that the officer in charge of the department should be a qualified dietitian with adequate experience in large-scale catering, or else that he should act in full consultation with a dietitian. To ensure effective working of the catering department, it was suggested, a catering or food service committee should be set up in each hospital. This committee should be fully representative of the medical, administrative, and executive staff, and should coördinate their various interests and responsibilities.

Evidently some hospitals have followed this recommendation, for advertisements for dietitian-caterers appear at intervals. Abroad, the appointment of dietitians to take charge of catering is no new venture; it is the rule in the United States and in some of the Dominions and Colonies. But it is an act of piety rather than sense for a hospital committee to appoint a dietitian and then sit back with folded hands feeling that all is well. In the first place, there are not yet enough dietitians to go round. Secondly, unless she is backed by a strong committee and given definite powers, even the best dietitian will be helpless before the tangle of custom, prerogative, and prejudice which make up the briar-patch of hospital feeding. Moreover, dietitians vary as much as other people. Some have natural authority, some must acquire it; some have the knack of getting on with people, others set them by the ears. And some, though fully trained, are young and inexperienced and must learn to apply their knowledge. Courses in dietetics are still young, and to some extent experimental and incomplete. Thus, many newly qualified dietitians have little practical experience of buying, checking, and costing—all important parts of their work. The Association of Dietitians is anxious to see this side of training improved, and recommends newly qualified members to seek postgraduate experience in catering.

In at least one large London hospital the feeding of patients and staff is managed by a caterer, a dietitian, and a steward working together as a team. The food in that hospital is good; and, as we noted in our leader, the reforms which led to the appointment of the present officers indirectly lowered the cost of the department. Appointment of trained workers, including cooks, at higher salaries led to substantial savings in other directions, far outweighing the greater wage-bill. The buying was done more economically; proper checking prevented mistakes in quantities; and attractive menus, good cooking, and careful serving reduced the contents of waste-buckets. At this hospital there is already the framework for a full training school for dietitians, caterers, and stewards, which might well be developed on a large scale as soon as the war is over. At present difficulties of accommodation and staffing make such an undertaking impossible, though short-term courses have already been arranged, on behalf of King Edward's Hospital Fund, and have been well attended by assistant matrons, housekeeping sisters, stewards, and cooks.

Another example of improvement in catering has been reported from an EMS hospital.[1]

> This hospital received all provisions from the parent hospital, at which all the buying was done. The menu was arranged by a stores clerk, who was also responsible for issuing stores to the kitchen. Only daily quantities were issued, and they only reached the kitchen at 6 P.M. on the night before use; so nothing could be prepared in advance. Kitchen work was continually hampered by lack of essential equipment, such as vegetable knives, dishes, and trays, and containers to fit the trolleys. Shelving in the cold-storage rooms was inadequate, and the ovens were badly placed.
>
> The first measure was to place absolute control of the catering department in the hands of one man. The steward, working under him, continued to do the buying, and was given more help with the routine work of his office. A store of cereals and canned and dried goods was set up in the kitchen; flour was delivered there direct, rationed goods in bulk once a week, and meat at least a day in advance. This made it possible to plan ahead, to vary the menu, improve suppers, and get rid of unpopular commodities like black-pudding. Equipment and kitchen layout were improved, and better relationship was established between the different sections of the catering department. A pastry-cook was appointed, and later a dietitian with catering experience took over the post of catering supervisor. The structure of the kitchen side then became:



The article [illegible] for a catering supervisor [illegible]lerstanding of other peop[illegible] the reforms, which were accomplished within 5 months, were thoroughly satisfactory.

STAFFING AND EQUIPMENT

Evidently, then, we need more dietitians with experience of catering, and more arrangements for training them. But in the meantime, experienced caterers are to be found who can begin the task of reorganisation, especially if they have the advice of doctors interested in diet. After the war more of these experts will be released from the Forces and from canteen work, and they will prove valuable personnel not only to work with dietitians, but to train students of dietetics in catering. If a catering supervisor who knows his or her job is appointed, parsimony in the buying of food will be at an end. A comparable liberality must be shown in the staffing and equipment of kitchens and wards. Everyone must have the tools to do his job. Mechanical potato-peelers, good ovens, plenty of knives, forks, and spoons, enough dishes, enough proper containers, heated trolleys, hot-plates in the ward, trays, linen, and glass, and adequate washing-up equipment, are not luxuries but the bare essentials needed by those providing meals for patients. They must be provided ungrudgingly, in the knowledge that they are going to mean better food at less cost. Capable cooks are an economy. "She was a good cook, as cooks go," said Saki; "and as cooks go, she went"—probably because she was dissatisfied with the terms and conditions of service. Hospitals cannot afford either to pay bad cooks, or to let good cooks go.

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[1] *Hospital*, May, 1944.

Large hospitals can and should afford to make these reforms either at once, or step by step as staff and equipment become available. For small hospitals the problem is somewhat different. Expensive equipment, highly-qualified chefs. and supervisors accustomed to large-scale catering would naturally be beyond their needs. There is no reason, however, why they should not engage a well-trained cook, and provide her with equipment equal to the work she has to do. Moreover, they should place a single person in control of catering, and give him or her adequate powers. If they cannot find an appropriate person to appoint they should send the most likely member of the staff to take a course in catering, such as those arranged by King Edward's Hospital Fund, and should give her every encouragement to study the subject further, to take qualifications, and to visit the catering departments of other hospitals. Where possible, small hospitals should combine together to purchase goods, or should entrust their buying to a large hospital in the neighbourhood. The London Hospital catering department buys for a large number of smaller hospitals, to their great advantage.

NURSE AND MEDICAL STUDENT

A new attitude towards the feeding of the sick—or rather, a return to the old attitude—cannot be bred too early in the medical or nursing student. The seniors of our own profession should search their consciences to find out whether they have harped sufficiently on this string in their ward rounds and lectures. Has the student been interrogated as often, for example, about the details of diet as about mitral stenosis? Can he say with equal confidence what went down the patient's gullet from his plate and from his medicine glass? Has he tried the food in the wards himself? A week in bed in some hospital other than his own would teach him wonderfully. Then, can the student nurse recite confidently the likes and dislikes, the preferred size of helping, and the special foibles, of every patient under her care? Can she assert accurately within six hours of the patient's admission whether he likes his tea weak or strong, with sugar or without? Finally, have both nurse and medical student been given adequate teaching on food values and nutrition? Is there any reason why they should not take a preliminary course of lectures on these subjects together, so that they could understand one another's responsibilities and difficulties?

The hospital should lead the way in food education. No place is more suitable for people to learn what is the best food to eat. The nurse can do much to teach them, not only in the hospital ward, but in the district. If she learns to criticise her own food intelligently on student-nurse committees, she will be fitting herself to keep a critical eye on food in the wards and to help to maintain a high standard.

THE SUMMING-UP

It would be laborious to touch again on the many points of detail. noted in these articles, which go to make up good hospital feeding. Attention to detail will eventually raise the standard of hospital food, as it has raised standards in surgery and nursing. Principles, however, must come first, and it will suffice here to recapitulate those we believe to be fundamental:

> It is the duty of his doctors and surgeons to see that the patient in hospital is properly fed.
>
> Catering should be in the hands of one responsible person, who should have adequate powers.
>
> The catering supervisor should be backed by a food advisory committee representing all those whose duties give them an interest in hospital food—the board, the doctors, the dietitian (who may be the catering supervisor), the matron, the steward, the ward sisters, and the cooks.
>
> Medical and nursing students should be taught the importance not only of diet but of the feeding of patients—the elementary principle of getting enough good food into them to support them while they are fighting illness.

Finally, equipment must be adequate and kitchen staff properly trained. Poor equipment and a low wage-bill in the kitchen are an unjustifiable extravagance.

NEW INTERNATIONAL SANITARY CONVENTIONS

DRAFTED and sponsored by UNRRA, two new international sanitary conventions, amending those at present in force, came into operation on Jan. 15. By that date the signatures of 17 of the governments of the United Nations, including France, Poland, Great Britain, the USA, and China had been affixed.

Even before the war it was recognised that advances in preventive medicine had made the present conventions obsolescent; the one governing sea and land traffic dated from 1926, and the one on air travel from 1933. For example, the development of immunisation against yellow fever has required changes in the yellow-fever clauses of the air convention. Moreover, the migrations of large numbers of people expected after the war demanded special consideration, although the health measures needed for their organised movement have been dealt with by a special agreement between the governments concerned, which it is hoped will shortly be signed.

UNRRA was entrusted with the work because the Office International d'Hygiène Publique—the technical body concerned with the revision of the sanitary conventions—was then in enemy territory. Early in 1944 UNRRA's expert commission on quarantine, under the chairmanship of Dr. P. G. Stock of the Ministry of Health, completed the work—in a remarkably short time. The drafts of the revised conventions were approved in principle by the Council of UNRRA at its second session in Montreal last September, and were referred to the standing technical committee on health for final revision. Meanwhile Paris had been liberated and negotiations to safeguard the position of the Paris Office and to ensure its collaboration with UNRRA were successfully undertaken. The English and French texts of the conventions are equally authentic.

UNRRA, as a temporary measure, until a full international sanitary conference can be called, will administer the new conventions and receive and transmit intelligence about epidemics. Such information will not, as hitherto, be confined to the occurrence of the five "convention" diseases (plague, cholera, yellow fever, typhus, and smallpox); for signatories are now under an obligation to notify UNRRA immediately of the presence and course of any epidemic disease which may be a menace to other countries. Signatory governments also undertake to pass on to UNRRA as regularly as possible statistics of all notifiable diseases in their countries; and UNRRA in turn will distribute its information to the governments concerned.

In addition, the conventions make a new departure in that to UNRRA is entrusted the delimitation of zones in which yellow fever is endemic, and the setting up of approved standards of yellow-fever vaccine. Action has already been taken by the quarantine commission of UNRRA in these matters. The conventions also recommend the adoption by governments of model international forms of certificates of immunisation against various diseases.

In England Now

A Running Commentary by Peripatetic Correspondents

BUDA-PEST. Ah yes, what a place! In exchange for talking English to the children of a Hungarian nobleman I was entertained for three months in Hungary during the summer of 1930. I spent the first two in the country shooting roebuck in Bekescaba and duck on the Tisca river. For my last month I lived in stately Buda, and used to cross the suspension bridge over the Danube and visit the Pest hospitals. As a second-year student with only an arm and a head-and-neck dissection to my credit I was treated with great respect. An introduction from high places got me an English-speaking gynæcologist as my guide. He entered into the game with enthusiasm, and delighted in introducing me to his non-English-speaking colleagues as "Doktor X, MD, of London"—they must have thought me an infant prodigy. I saw a mass of clinical material much of which was wasted on me. With my untutored eye I peered up cystoscopes, saw my first eclampsia, and as many as six confinements proceeding in one long room at once. The most memorable point of this exhibition was the uniform cry of "Yoi!" during the fiercer pains. The high light of surgery was four tables in one theatre.
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headed moment was when a surgeon of much local eminence waited half an hour for the arrival of "the London surgeon" to witness his method of gastro-enterostomy. The triumph was only marred by the presence of two New Zealand surgeons who, knowing my true professional status, ostentatiously asked my opinion whenever possible. The Hungarians were very friendly, and I wonder how they and their Fisherman's Bastion are standing up to the second Russian occupation within thirty years. I suspect that their geographical position and a too radical interpretation of their Versailles-born motto "Nem! Nem! Soha" has delivered them to their present predicament rather than any hatred of ourselves.

* * *

"Cash" in the village stores is rather a friend of mine. She is a thin delicate girl, often away ill, and has the eager gentle manner that one often finds in women of her type and physique. She sits all day on a high stool in her small glass box in a dark corner of the shop, and peeps out at one with bright eyes, like a friendly mouse. She loves to have a talk about Life in general, and our latest exchange of views was when I rang up about my weekly order. We progressed from coffee, via snow, my husband's strange choice of January for his last summer's leave, and slippery roads, to old age. Cash pities old people very much. "My mother," she concluded (she always quotes her mother), "says there is no pleasure in growing old in these times. There's nothing nice to eat, nowhere to go, and nothing to look forward to." This masterly summary of a point of view which must be shared by many ageing people left little to be said but a friendly farewell. It seems a singularly
for a thinking being; and it is
working classes, either. Even a
of mine, a Unitarian minister and
age, and refuses to agree with
rowning's

> "Grow old along with me;
> The best is yet to be,
> The last of life for which the first was made."

Ve have not really progressed much beyond the background of the Trojan War, in spite of 2000 years of hristianity.

* * *

Edward Grey thought he could hear a flycatcher inging more clearly if he watched him through glasses. If one notes a particular singer in a choir one seems to ear his voice above the hubbub and after a while one ppears to gather what manner of man he is—perhaps noustached, married, with mind set or undulated hair, lighty, not yet permanently mated. It is as though eye and ear reinforced each other's power. Do the other senses act in this cumulative way too? I think so. If you put your hands on the wireless and feel the vibrating voice, you may not be able to hear better, although I think you do slightly, but the auditory and tactile senses certainly try to make up for the absent sense, the visual, by giving a clearer picture of the
speal After all, the senses have
been or a good many millennia
now, to one you soon go to sleep,
as when you shut your eyes listening to the wireless or a sermon and in hypnosis. Nor are the so-called five senses the only ones employed in augmentation; the whole body thinks except the strictly keratinous—that is to say, sends afferent impulses, from which thought and perception is an efferent. A difference between the impulses coming from the finger tips and the psoas is that the former's originator was lucky enough to draw an outside position, but, of course, is denied inside information. The emotions too differ from the other afferent impulses only by delivering their message by the old autonomic postman to the thalamic post office *and not by phone. Years ago I used to go to service* in the village church with my mother. I sat on her right side and often used to turn my head to the left to look at her. Nowadays if I hear church music and turn my head to the left I recapture her picture with clarity; I don't if I turn my head to the right. If the musty smell of village churches and the gluteal oppression of a pew is also present, then on turning my head to the left I get a vision of almost hallucinatory clearness. Under certain conditions I can see a favourite lake in December twilight. I was going on a long voyage next day and I went down to have a last look at it, grey and gloriously dismal in a north wind and snow. I crouched down behind the sedges to suck it all in, and nowadays I can *see it like an etching if I crouch down in a cold wind.*

Clearly this is an important subject and has relevance to clairvoyance, hallucinations, hearing-aids, help for the blind, and the inducement of thirst by beer advertisements.

* * *

She was a damsel of generous proportions—I should have placed her in the 12 stone class. I winced as she seated herself solidly on the bed, prepared to examine the patient to whom I had introduced her as material to her passage to MB. Her approach to the problem

to consider the possibility of bronchiectasis. Her acquiescence was enthusiastic and uncompromising. Interrogated as to further steps in order to establish this

why not employ one of the senses with which she had been conveniently endowed; that of smell for example? Was she not aware of something obtrusive, stealing upon the air? "I've got a bad cold," she answered. That was one up to her: and then the bell rang.

Meditating upon the olfactory, I was reminded of another examination episode. I was associated with a very short-sighted pharmacologist in the oral examination of an exceptionally attractive young lady whose charms had not been without effect during her previous experiences of the other tables. Her mental equipment was by no means commensurate with her physical, and her beauty was thrown away on the undiscriminating myope who dryly observed to me as her highly perfumed person left the room: "I think we shall smell her again."

The young man who had
upon a cardi
termed a roari
been provided est, an electro-
cardiogram, an sedimentation-
rate. I pondered with some sadness on the past, when
our predecessors cond
save with the monau
veniently concealed
they did very well.
future
look lik
(not *I*)

Parliament

GOODENOUGH RECOMMENDATIONS

The Minister of Health announced in the House of Commons on Jan. 18 that the Interdepartmental Committee on Medical Schools had recommended a comprehensive programme for the reform and development of medical education and research. Certain of the matters, he continued, would require legislation, and these the Government propose to discuss with the bodies concerned. Apart from these the committee's recommendations are in the first place for the responsible educational authorities to study in framing their future policy, and the Government accordingly invite universities, medical schools, and teaching hospitals to give the report early consideration.

Recognising the fundamental importance of medical education and research to the future of the country's health services, the Government accept the principle of increased grants for the purposes of medical education and research, to be distributed by the University Grants Committee through the universities to medical schools, postgraduate schools and institutes, and hospitals used for teaching and research. They also accept the suggestion that for a limited period these additional grants should be separated from the block grants received by universities for their work as a whole. The amounts of grant to be made from time to time, whether for capital or for recurrent expenditure, will be determined after consideration in the light of the recommendations of the University Grants Committee and the general financial position prevailing.

The Government share the views expressed in the report on the importance of affording to women equal opportunities to those enjoyed by men for medical training and for obtaining postgraduate experience. They have, therefore, decided, as recommended by the committee, that future payments of grant to medical schools should be conditional on the adoption by the schools of the principle of admitting a reasonable proportion of students of both sexes. They recognise that schools at present open to one sex only may need periods of varying lengths to adjust their arrangements to a co-educational basis, and they therefore propose that the University Grants Committee in consultation with the university authorities concerned should be charged with the responsibility of determining from time to time whether the action taken by each of these schools complies with the principle to the extent that is reasonable.

The Government attach equal importance to the revision of the medical curriculum, and their acceptance of the principle of increased grants for medical education and research is dependent on the early completion of this process. They are, therefore, glad to learn that, as recommended by the committee, the General Medical Council has already taken the initiative in the matter.

QUESTION TIME

Emergency Medical Service

Mr. W. S. Liddall asked the Minister whether, in view of the fact that throughout the country many people were unaware of the activities of the Emergency Medical Service, he would make a statement on the valuable services that had been and still were being rendered.—Mr. Willink replied: I can hardly deal adequately in an answer to a question with the widespread activities of the Emergency Hospital Scheme, which provides treatment not only for the sick and wounded of the Forces and for air-raid casualties, but also for many classes of civilian sick and injured. The scheme has also developed such allied services as rehabilitation, blood transfusion, laboratories, and ambulances. There may be an opportunity of reviewing the scheme as a whole on some future occasion such as a debate on the Estimates. I should like, however, to pay my tribute now to the hospital authorities, and to the medical, nursing, and other staff of the hospitals, who have cooperated so well with my officers in making the scheme a success.

Mr. F. Messer: Does the Minister agree that this is an excellent illustration of the efficiency of large-scale medical service.—Miss Horsbrugh: It is certainly a success as a scheme, through the cooperation of all those working for the sick and injured.

Deaf Aids Committee

Sir Douglas Hacking asked the Lord President of the Council whether he would give the names of the members of the committee which had been appointed to advise and assist the Medical Research Council in promoting research into electro-acoustical problems relating to the design and application of instruments in alleviation of deafness; and whether he had anything to report as a result of the labour of this committee.—Mr. C. Attlee replied: The names of the members of the committee are as follows: Mr. W. C. Radley (chairman); Mr. E. J. Barnes; Sir Lawrence Bragg, FRS; Mr. N. Fleming; Mr. C. S. Hallpike, FRCS; Mr. L. C. Pocock, and Mr. T. S. Littler (secretary). The committee have formulated a detailed programme of research, and investigations in which physicists are collaborating with otologists and physiologists are in progress. The investigations now in hand will necessarily take some time to complete, and it is not anticipated that the committee will be in a position to make any recommendations before the end of the year.

Nurses Bill

On Jan. 17 the Earl of Listowel introduced a Bill in the House of Lords to exclude county and district nursing associations and other similar organisations from the operation of part II of the Nurses Act 1943, and part II of the Nurses (Scotland) Act 1943.

Tuberculous Repatriated Prisoners of War

Miss I. Ward asked the Secretary of State for War whether he was aware of the dissatisfaction of relatives with the arrangements made for repatriated prisoners of war suffering from tuberculosis; and if he would consider these complaints with a view to an alteration of the present policy.—Sir James Grigg replied: It is the policy of the Army to discharge soldiers suffering from tuberculosis as soon as possible, so that if necessary they may enter civil sanatoria near their homes. Repatriated prisoners of war are given special consideration, but I am aware that there is sometimes delay in admission owing to pressure on accommodation. The Minister of Health has therefore set aside a number of beds in EMS hospitals for Service patients awaiting transfer to sanatoria. This should materially help to remove any cause for complaint.

Dr. Edith Summerskill: In view of the fact that these men contracted the disease in the Army, can the Minister say why he is shelving his responsibility in this matter?—Sir J. Grigg: Because that happens to be the arrangement prescribed in the Army regulations. The Army do not look after tuberculosis patients. Patients discharged for disability in the Army are looked after in the case of tuberculosis by the Ministry of Health, and in the case of other diseases in Ministry of Pensions hospitals.

Discharge of Men of Low Medical Category

Mr. W. J. Brown asked the Minister whether he was aware that, as the Government's interim demobilisation plan made no provision for exceptional treatment of officers and other ranks relegated to low medical categories unfitting them for further combatant service, such persons were now retained on sedentary work in home establishments; and whether, to facilitate their rehabilitation in civilian life, he would arrange that persons sent back to this country on relegation to medical category C might be granted honourable discharge in advance of the demobilisation plan.—Sir James Grigg replied: The present man-power position does not enable us to dispense with the services of officers and men who can be usefully employed in the Army. Those working in home establishments are, in fact, releasing fitter men for employment overseas.

Food Subsidies

Sir W. Smithers asked the Chancellor of the Exchequer what is the latest figure of the annual amount found by the taxpayer to keep the cost of food prices at 68 points above the 1914 level.—Sir J. Anderson replied: The latest estimate of the cost of the food subsidies is that they are running at the rate of £218 million.

National Loaf

Colonel J. Llewellin informed Sir E. Graham-Little that the national flour content of the national loaf is approximately 75%. When milling 82½% extraction flour the 17½% abstracted contains about 90% of the total fibre of the wheat grain together with small quantities of the other constituents which adhere to the branny particles during the milling process.

Empire Casualties

In answering a question the PRIME MINISTER circulated the table given below, showing the casualties to all ranks of British Commonwealth and Empire forces reported from Sept. 3, 1939, to Nov. 30, 1944.

	United Kingdom	Canada	Australia	New Zealand	South Africa	India	Colonies	Total British Empire
Killed, including died of wounds or injuries	[illegible]	28,040	18,015	8,919	5,783	17,415	1,493	282,162
Missing	[illegible]	1,807	6,913	928	599	13,935	14,015	80,580
Wounded	[illegible]	39,010	34,336	17,115	11,796	15,224	3,686	386,374
Prisoners of War including Service Internees	[illegible]	7,128	25,597	7,153	10,765	76,023	6,752	294,438
Total	[illegible]	78,985	84,861	34,115	28,943	152,597	28,946	1,043,554

Paper for Medical Books

Major NEVEN-SPENCE asked the President of the Board of Trade whether he was prepared to increase the paper quota available to the medical group of publishers in order to counteract the growing decline in the production of medical books.—Captain C. WATERHOUSE replied: Quotas of paper are based on publishers' pre-war usage, and do not vary with the types of books they produce. Last autumn, however, a substantial increase was arranged in the special reserve for books of particular importance, including medical books, which publishers cannot produce from their quotas.

Major NEVEN-SPENCE asked the Minister of Labour whether he was prepared to secure the release of key men in the printing, engraving, and binding trades employed by the medical group of publishers in order to overcome the serious decline in the production of medical books.—Mr. ERNEST BEVIN replied: I am not aware that publishers of medical books are prevented by labour difficulties from making full use of the paper available to them.

Hernia in Miners

Mr. NESS EDWARDS asked the Minister of Fuel and Power if he had had examined the large number of cases of hernia occurring in the mining industry; to what extent the incidence of this type of disability could be reduced if a tub of lighter construction was introduced; and if he would take steps to have this matter investigated.—Major S. LLOYD GEORGE replied: Exact figures of the incidence of hernia in the mining industry are not available, but such information as I have does no[illegible] that the number of cases is abnorm[illegible] applications by miners to leave [illegible] rounds show that in only about 1% of the cases is hernia advanced as the cause of disability and the ground for the application. I am advised that the weight of tubs, which, of course, varies from mine to mine, is only one of several factors which may cause, or contribute towards, hernia, and many other considerations would have to be taken into account before tubs of lighter construction could be introduced. In so far as the man-handling of tubs is a contributory cause of hernia, the remedy would appear rather to lie in effecting improvements in the haulage system, which is one of the matters before the technical advisory committee now sitting.

Nursery Schools

Captain J. H. F. MCEWEN asked the Minister of Education what had been in England the cost of nursery schools set up since the war; and how many children had made use of them.—Mr. R. A. BUTLER replied: Three nursery schools have been established by local education authorities in England during the war at a capital cost of about £16,000; in 1943–44 the net maintenance expenditure was £5280 and the average attendance 240. Three nursery schools were established by voluntary bodies. I have no figures of their capital cost; in 1943–44 the net maintenance expenditure was about £1730 and the average attendance 125.

Birth Certificates

Commander O. S. L[illegible] asked the Minister of [illegible] ior.—Mr. WILLINK replied: A person acting in the statutory capacity of informant for the registration of a birth is entitled to obtain from the registrar an acknowledgment that this statutory duty has been discharged. I am not prepared to restore the present form of acknowledgment to that of the form which was superseded some 20 years ago because it did not satisfy its sole purpose as above described and contained particulars which made it the equivalent of an irregular birth certificate. The earlier form, if restored, would not satisfy the requirements of the numerous statutory provisions as to evidence of age.—Sir E. GRAHAM-LITTLE: Will the Minister take particular care that there shall be no information in such certificates involving breach of professional secrecy?—Mr. WILLINK: Certainly.—Commander LOCKER-LAMPSON: Will the Minister receive a deputation so that we may press the claim?—Mr. WILLINK: I am quite prepared to consider that.

Direction of Doctors in War-time

Sir ARTHUR EVANS asked the Minister of Labour what was the present position of the Cardiff doctor, now in general practice in that city, who was found guilty of failing to comply with the direction of a National Service officer under the Defence (General) Regulations, requiring him to undertake a resident hospital post and, as there was no appeal against such a direction and conscientious objection was only recognised in the armed Forces of the Crown, what action he proposed to take to ensure that Regulation 58A was complied with.—Mr. BEVIN replied: The doctor in question failed to comply with a direction to take up a post in a hospital, alleging conscientious objections. For this offence he was convicted and fined, but he remains liable to be directed to other suitable employment and directions will be issued accordingly if and when a post is found for him which is suitable, having regard to his experience, qualifications, and other circumstances.

Milk-supplies

Sir PERCY HURD asked the Minister of Agriculture what steps were being taken to enable the general public to obtain a more adequate ration of liquid milk.—Mr. TOM WILLIAMS [illegible] ticable [illegible] in the [illegible]

Sir P. HURD: Was the Minister correctly reported as stating that we shall not have a better ration for the general public till 1949?—Mr. WILLIAMS: I think the Minister said that he feared that it might not be possible completely to abolish rationing before 1949. Year by year since 1939 there has been a continued increase in the production of milk.

Bedding and Upholstery Fillings

Mr. H. THORNEYCROFT asked the Minister of Health whether he had yet considered the representations made to him by the Manchester city council upon the use of unclean fillings in bedding, upholstery, and other domestic articles; and would he, in the interests of public health, take steps without delay to grant to local authorities further statutory powers to enable them to ensure the cleanliness of all fillings used in the manufacture of such articles.—Mr. WILLINK replied: As indicated in a letter sent to the council on Dec. 22, arrangements are now being made for the resumption of the sittings of the departmental committee which has this whole subject under review.

Friendly and Approved Societies

Sir PATRICK HANNON asked the Minister of National Insurance if his attention had been called to the confusion which had arisen among large numbers of people in their failure to realise the distinction between Friendly and Approved Societies; and if he would indicate briefly the purpose and function of these bodies, respectively, in relation to the Government's proposals.—Sir WILLIAM JOWITT replied:

Continued at foot of next page

UNIVERSITY STUDENTS AS CRITICS OF FACTORY LIFE

SIR,—In your annotation last week you state that "medical examinations were said to be perfunctory in the extreme." This is misleading. The statement is derived from the remarks of one student who thought that the workers unjustifiable (*sic*) distrust of the medical facilities might be due to the impression left by the routine inspections. These inspections were only intended to sort out cases with obvious dermatitis and should not be confused with other types of medical examination.

It would be unfortunate if members of a medical service who were responsible for initiating an important piece of medical research and who gave us exceptional help and facilities, should be misrepresented. The paragraph on medical services in the original article was intended as a comment on how little the average worker understands what is being done for him, not as a criticism of the existing medical services, which were in fact very good.

Oxford. ALICE STEWART.

WHO SHOULD FEED THE SICK?

SIR,—For the first 4½ years of the war I was matron of a voluntary hospital, where I was responsible for the catering for 400 persons daily. It was my first care that everyone able to take ordinary diet should receive a full share of all rationed articles, and I cannot remember a single complaint from a patient, while a number expressed appreciation.

The great difficulty lay with the resident medical staff, who expected and demanded a higher standard of catering and an excessive share of the rationed foods. From them I received frequent complaints, which were also made to members of the committee. I was told that in their experience the resident medical staff of other institutions were not rationed so strictly. On one occasion the entire "house" staff left the hospital to get a meal outside, because the meat was tough! There were threats of resignation unless matters were improved, and I lost several members of a reduced domestic staff as a direct result of continuous complaints and criticisms. Complaints were always investigated, but were almost always found to be unjustified; and one resident joining the staff direct from the Services was kind enough to come to tell me that he considered the food was excellent. He was obviously disgusted by the attitude of some of his fellows.

As an administrator of some years' experience, I know that this is no isolated case, and that it demands great strength of mind to stand firm against the innumerable difficulties resulting from the attempt to assure really fair rationing. Naturally, the caterer is anxious to satisfy everyone, and recognises that the very hard-working staff deserve and should have the very best that can be provided within the rationing scheme. The task would be enormously lessened if young resident officers realised that hospitals are rationed like households, that one member can only exceed his or her share at the cost of another, and that with the double difficulty of rationing and of domestic shortage it is impossible to attain the standards of a first-class pre-war hotel.

ADMINISTRATOR.

SIR,—Members of my society are keenly interested in your illuminating discussion of this subject. They would like to help.

Caterers sometimes are hospital patients and have had repeated occasion to observe weaknesses in hospital catering which they believe they could remedy. As we see it the principal defect is not in dietetic knowledge but in organisation. We can confirm that, in many instances, hospital catering could be vastly improved, and at the same time its cost could be reduced, by expert buying, checking, costing, and cooking, as in the example you mention.

A major weakness in the academic domestic science training, we have found, is that, as you say, "first-hand experience of large-scale catering is not at present considered essential for the diploma." Some students who qualify for these diplomas develop aptitude for the hard practical work of large-scale catering with experience in it. Others do not. A wide gap between theory (or dogmatic [illegible] ility to expound it, on the hand, and [illegible] to do, is conspicuous in the field.

The council of my society would be very willing to appoint a panel of caterers, with well-tested practical experience in various kinds of large-scale catering, who would gladly serve, in an honorary capacity, on hospital food service committees, or in other wa[illegible] at hospitals. [illegible] interested care to communicate with me, we shall do our best to advance the suggestion in a practical way.

National Society of Caterers to Industry, ARTHUR LAWSON,
83, Pall Mall, London, SW1. Secretary.

*** A correspondent commenting on our reply to Sir Robert Hutchison last week suggests that the fat ration does not amount to 77 g. per day, but only to about 32 g. It should be explained that 77 g. represents the total fat in the ration, including fat present in butter, margarine, cooking fat, cheese, bacon, milk, and meat to the value of 1s. 2*d*. The amounts of fat found in milk and meat vary, of course. The Ministry of Food has estimated that the daily fat allowance from all foods available (not merely rationed foods) averages 88 g.—ED. L.

Public Health

VITAL STATISTICS OF SEPTEMBER QUARTER

THE Registrar-General reports that in England and Wales during the last September quarter the number of births was 14,352 more than in the same quarter of 1943. It represented a rate of 17·6 per 1000, the highest third-quarter rate since 1926. In the first nine months of the year live births totalled 567,130, compared with 522,287 in the same period of 1943. The infant-mortality rate for the September quarter was 40 per 1000 live births; the death-rate was 10·3 per 1000, against 9·4 in the same quarter of 1943. The natural increase of population was 76,340, the corresponding increases for 1941, 1942, and 1943 being 46,285, 71,000, and 70,833.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED JAN. 13

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1330; whooping-cough, 1678; diphtheria, 459; paratyphoid, 5; typhoid, 5; measles (excluding rubella), 10,979; pneumonia (primary or influenzal), 1399; puerperal pyrexia, 127; cerebrospinal fever, 53; poliomyelitis, 7; polio-encephalitis, 3; encephalitis lethargica, 4; dysentery, 302; ophthalmia neonatorum, 58. No case of cholera, plague, or typhus fever was notified during the week.

[illegible] Infectious Hospitals [illegible], 985. During the [illegible]: scarlet fever, 46; [illegible]; [illegible], 23.

Deaths.—In 126 great towns there were 1 (0) deaths from enteric fever, 3 (0) from scarlet fever, 18 (2) from measles, 13 (1) from whooping-cough, 5 (1) from diphtheria, 52 (2) from diarrhœa and enteritis under two years, and 52 (2) from influenza. The figures in parentheses are those for London itself.

Liverpool reported the fatal case of an enteric fever. There were 6 deaths from influenza at Liverpool, 5 at Birmingham, and 4 at Manchester.

The number of stillbirths notified during the week was 203 (corresponding to a rate of 30 per thousand total births), including 18 in London.

VITAMIN C AFTER MEALS.—In an investigation of vitamin C reserves in RAMC personnel, W. R. G. Atkins and R. A. Fisher (*J. R. Army med. Cps*, 1944, 83, 251) observed that men receiving ascorbic acid after breakfast became saturated much sooner than those who received it before breakfast. No other differences in the two groups were apparent, and the conclusion must be that vitamin C is more effective if given on a full stomach.

Obituary

THOMAS BARLOW

BT, KCVO, M D LOND., D SC, LL D, F R C P, F R S

THE medical profession may well give thanks for the long and valuable life of Sir Thomas Barlow, 1845–1945. His contributions to science were equalled by his contributions to practice through the example of integrity and noble aims. From the beginning to the end of his 74 years as a doctor he worked effectively for the good of the profession he loved.

He was born on Sept. 4, 1845, at Edgworth in Lancashire, son of James Barlow, JP, and Alice Barnes. From Owens College, Manchester, he passed to University College, London, and took his B Sc at the age of 22. Qualifying rather late, in 1871, he went through all the resident posts at University College Hospital, where he was known for his shrewdness and sympathy—flavoured with a touch of Lancashire. In his ext appointment, at the Hospital for ick Children, Great Ormond Street, he won the following tribute from Robert Bridges, then a student: "Of all the doctors I ever knew, he was the one who had most intimate personal sympathy with his patients."

Barlow's conduct of his duties, as well as the part he began to play in the debates of the old Pathological Society of London, made him a marked man. He became assistant physician at Great Ormond Street in 1875, and held the same appointment for a year at Charing Cross and two years at the London ospital before returning in 1879 to niversity College Hospital. Already is writings showed a wide range and a im for the practical. In the *Transctions* of the Pathological and Medicohirurgical Societies, and in these olumns, he began the publication of otes on fœtal rickets and its diagnosis, nd on rheumatism and pleural effusion children, which established his posion as an original pathologist. Nearly 62 years ago, in larch, 1883, he read the paper which made his name. n this communication he established that infantile curvy is identical with scurvy as seen in adults. But e also did more; he was the first to show that rickets no essential part of the disease—an observation that radually led to the discontinuance of such terms as cute rickets, hæmorrhagic rickets, and scurvy rickets. V. B. Cheadle in 1879 had recognised the scorbutic ature of these cases, which he called scurvy supervening n rickets; and Barlow—always ready to acknowledge he work of others—repeatedly explained that Cheadle's linical observations preceded his own description of he pathological anatomy of infantile scurvy to the ledico-Chirurgical Society in 1883.

In his Bradshaw lecture to the Royal College of hysicians in 1894 he carried further his account of the lisease known by this time as *die Barlowische Krankheit* n Barlow's disease. The lecture, published in THE ANCET, embellished the clinical picture with several dditional touches, including the "sinking backward of he sternum" and proptosis, and laid more stress on the rinary symptoms. It [illegible] of the whole subject. [illegible] vas attributed to the [illegible] nd suggested in 1873 a scorbutic origin for a case of the ind described on the Continent as acute rickets. This uggestion had been dismissed by the German school, ut was supported by Samuel Gee and Cheadle. Barlow imself, by post-mortem examinations, had been able o demonstrate an anatomical substratum for many of the symptoms found, and the lecture began with a review of the main anatomical features of the syndrome whose existence had been deduced 11 years previously. Pathology in every department has made vast progress in theory and in detail since 1894, but no-one can read this [illegible], admiring the contemporary [illegible] ithout seeing the permanent [illegible] Barlow (and indeed Cheadle before him) fully understood that scurvy was a deficiency disease, and emphasised the preventive and curative value of "living food": "the further we get from a living food," he said, "the less is the antiscorbutic power." It was many years before vitamin C was discovered; but, as we wrote in 1935:

> It has been the rare privilege of Sir Thomas Barlow that he has been able to witness, as a consequence of his work, the complete conquest of the acute manifestation of the disease which he described, and the abolition, not only of death from this cause but also of the intense suffering which preceded it. Moreover, he has seen a significant change in the character of the disease and the birth of a sure and certain hope that infantile scurvy even in its latent form will soon belong only to the past. Such a reward is vouchsafed to few men, and of Sir Thomas Barlow it may be said that none has deserved it more.

Barlow's other contributions to medicine were many. He was greatly interested in rickets, and in conjunction with Judson Bury wrote in Keating's *Cyclopædia of Diseases of Children* (1889) a careful description of the course and morbid anatomy of this disease. He was also interested in rheumatism in children, and at the International Medical Congress in London in 1881 he produced with Francis Warner an important paper "on subcutaneous nodules connected with fibrous structures occurring in children the subjects of rheumatism and chorea." He had been observing such nodules since 1875, when a single case was recorded by a French writer (Meynet). With Warner he was able to tabulate a series of 27 cases, and describe the histology. Two years later he propounded the view, now very generally accepted, that these nodules correspond with the inflammatory exudate on the cardiac valves in endocarditis—a view which gives the nodules a clinical [illegible] affected the hea[illegible] of the earliest to recognise in infants a form of meningitis different from the "dropsy of the brain" described by Robert Whytt (the tuberculous meningitis of later writers), and also distinct from [illegible] found sometimes with empye[illegible] he contributed to the *St. Barth*[illegible] for 1878 an article "on the [illegible] infants," showing that the essential lesion was a basal meningitis, different in appearance from that of tuberculous meningitis. The cause remained a mystery, but the authors came very near the truth when they specially noted the clinical resemblance to epidemic cerebrospinal meningitis, and only rejected the causal association because they could find no evidence of epidemicity in their cases. Sixteen years later Barlow wrote with David Lees in Allbutt's *System of Medicine* on this same disease, whose bateriology had then recently been described. The volume also contains his account of tuberculous [illegible] in its thoroughness and minute [illegible] l and pathological. He was elec[illegible]ognition chiefly of his research into rickets.

It would be a mistake to suppose, however, that Barlow confined himself to pædiatrics. He was a general physician, enjoying as such the confidence of his colleagues, and he was one of those chosen to attend Queen Victoria in what proved to be her last illness. Physician to the Royal Household from 1896 to 1910, and [illegible] Queen Victoria, King Edw[illegible] was created a baronet and [illegible] 1901. At the Royal Colle[illegible] which he was elected fellow [illegible] 1910 to 1915. The position of [illegible] aintained was manifest when [illegible] er the International Medica[illegible] on. At University College [illegible] lme chair of clinical medicine, and for the University of London he did much good work. His honorary degrees included the LLD of Aberdeen, St. Andrews, Durham, Harvard, Montreal, Toronto, and Edinburgh, the D Sc of London and Victoria, and the MD of Christiania and Dublin.

Barlow married, in 1880, Ada Helen Dalmahoy, who died in 1928. They lost a son in the last war. Of the two surviving, Sir Thomas is in the family business of cotton manufacture, and Sir Alan is second secretary to the Treasury; while his daughter has been his companion for many years. As with many men of brilliant mind, his interests were not circumscribed by his profession; he was an informed botanist and geologist and a student of art and music. Of late years, outside his own circle, he was best known to most of us through his presidency of the Royal Medical Benevolent Fund, dating from 1920. The older he became, the more interest he took in enlarging the scope of the Fund's activities, and his personal concern over the difficulties of applicants was remarkable. It was mainly at his suggestion that the Fund began to send at Christmas a small and unexpected gift of money, with a friendly message of remembrance and encouragement, to its poorest beneficiaries. At first a few gifts of a pound were sent to those in the greatest need of help; but these gave such delight, not only in the gifts themselves but in the "being thought of" by strangers, that an effort was made to expand this truly Christmas service. Since 1929 Barlow has addressed every Christmas a personal appeal to the medical profession through the medical press, and the response has been increasingly generous. Born in "the hungry forties," the alleviation of cold and hunger always appealed to him, and it was a constant joy that his efforts were successful.

The vitality that helps some men to rise above their fellows may tend to give them longer life; but the burdens of success make it very rare for a man of such distinction to reach so great an age as Barlow's. The span of his life seems something of a marvel when septuagenarians tell us that when they reached Great Ormond Street as house-physicians he had already retired from the active staff, after 20 years of service. THE LANCET of the week in which he was born contains an informative article by Mr. Prior, deputy inspector of hospitals and fleets, on the legal responsibilities of medical men in attendance upon duels.—Moreover, he lived all his 99 years fully, retaining to the last his penetrating intelligence and much of the remarkable memory that served him so well as a clinician. Though he was happy in his country home near Wendover, he could never be long away from Wimpole Street, where he continued to see a few old patients and could keep in closer touch with the Benevolent Fund.

Those who wish to emulate Sir Thomas Barlow's professional success and unembarrassing longevity may profit by his advice to medical students of University College Hospital in 1928, the last long pronouncement from him that appeared in this journal.

> I can hear you say: "Who is sufficient for these things?" You are all sufficient if you will learn by blunders and chronicle in your own records your mistakes. Be sure to index your notebooks—names of persons if possible, but another section for diseases. Be determined to maintain your own health at the maximum of fitness. Keep Saturday afternoons for athletics and country walks. Burn very little midnight oil. Avoid scratch meals and the doctor's bad habits of bolting food. A cigarette after lunch and dinner has its place, but don't smoke whilst you are working. Take the minimum of alcohol and only with food, and best of all try experiments on yourself of doing without.
>
> Save a little time every day for general reading, the Bible first of all, then Shakespeare, and the great English essayists, poets, and historians, Bacon and Addison, Boswell's *Johnson*. Don't forget Montaigne and Erasmus's *Colloquies*, and Balzac's *Médecin de Campagne*, the most beautiful picture of a country doctor's life. Godlee's *Life of Lister*, one of the best biographies in the English language, will make a special appeal to University College Hospital men. Good music and good drama have their occasional rightful place.
>
> You must cultivate good friendships . . . but keep your links with home firm and constant. Tell your people about every part of your work and play and about your teachers and fellow students.

But assiduity, moderation, and affection do not wholly explain the achievements of this stocky, downright, kindly Lancastrian. He had great gifts and used them greatly.

GEORGE BUCKSTON BROWNE

KT, LL D ABERD., F R C S

Sir Buckston Browne, benefactor of the Royal College of Surgeons and its oldest fellow, died in London on Jan. 19 at the age of 94. Like Sir Thomas Barlow, he was born in Lancashire and trained at University College Hospital. And like Barlow he made his old age fine and constructive.

Born in 1850, he was the only son of Henry Browne, physician to the Manchester Royal Infirmary, whose father, grandfather, and great-grandfather had been medical. He did well both at University College and at the Hospital; he won the Liston gold medal for surgery, and "in 1873, after a three days' competitive examination, two days before the whole school, in operating theatre and mortuary, I was fortunate in winning the house surgeoncy no 1" in which he worked under Sir John Erichsen. His wards, he recalls, had several cases of hospital gangrene; and no wonder, for after amputation the stumps were wrapped in picked oakum, and ligatures were often of raw hemp. "Surgeons and dressers wore old coats often stiff with dried blood, and we washed our hands in a small basin on the ward table." But the surgical registrar was Marcus Beck, a nephew of Lister's; and Lister sent from Scotland his first antiseptic dressings. "Our hands were often sore, and some patients had carbolic acid poisoning, but the immediate results were splendid, and many a compound fracture was saved from amputation."

In 1874, when he became MRCS, Buckston Browne was invited by Sir Henry Thompson, of UCH, to become his private assistant. Thompson had gained a great reputation by his skill in cutting for the stone, and his assistant became his collaborator. In 1884 he began to practise on his own account, and the demand on his services was such that in 27 years, it is said, he took no holidays, his only exercise being a walk of 20 or 30 miles of a Sunday. An obituary in the *Times* recalls that his eminent patients included R. L. Stevenson and George Meredith, who "gratefully inscribed to George Buckston Browne, surgeon," the novel *Lord Ormont and his Aramintа*. Though he held no hospital appointments (nor any diploma beyond the MRCS) he achieved success as a urologist, and his immense experience is manifest in his lectures to the Harveian Society in 1901, on Twenty-five Years' Experience of Urinary Surgery in England, published in full in these columns.

In 1909 he gave up practice and began his years of retirement with a journey round the world. But the last war saw the death of his only son, Lieut.-Colonel George Buckston Browne, and by 1926 his wife and his grandson had also died; the only remaining member of his family was his daughter, who had married Sir Hugh Lett. Perhaps for this reason, he devoted himself more and more to schemes for the benefit of the public and the profession. The most important of these was realised at Downe in Kent where in 1927 he purchased the whole of Charles Darwin's estate. The house where Darwin lived and wrote was filled with Darwiniana and committed to the care of the British Association as a national memorial, suitably endowed. In 1931, with a gift of £100,000, he enabled the Royal College of S[illegible] to build nearby the surgical research farm wh[illegible] his name. The college had conferred its fellowship [illegible] him in 1926, and in the following year he endowed the annual dinner at which, before the war, 50 members dined with 50 fellows. On these and other public occasions Buckston Browne, if he spoke at all, always had something interesting to say, and said it in a way that his juniors might envy: soft-spoken and self-effacing, he had in public a clear strong voice, and he said precisely what he intended. The Harveian Society also benefited by the endowment of a dinner and a biennial prize. Other gifts were made to University College Hospital, where he endowed a bed and furnished the senior common-room of the medical school; to St. Stephen's Church at Sparsholt in Hampshire, where his wife was born, and to St. Thomas's School in London. Himself a discerning collector he presented works of art to various galleries, museums, and medical bodies. These many benefactions revealed

the Royal College of Surgeons made him a trustee of the Hunterian Collection and gave him its gold medal, the University of Aberdeen conferred on him an honorary degree, and the Society of Apothecaries created him an honorary freeman. He was knighted in 1932.

ISABELLA DOUGLAS CAMERON

M D EDIN., M R C O G, D P H

Dr. Isabella Cameron, who died in Edinburgh on Jan. 10, was for 25 years an officer of the Local Government Board and of the Ministry of Health, where she had a large share in developing the maternity and child-welfare services. The daughter of a schoolmaster, she was born at Stanley, in Perthshire, and one of her brothers, J. F. Cameron, is master of Caius College, Cambridge.

In 1898 she graduated with distinction at the Medical College for Women, Edinburgh. During her medical course she was already acting as a demonstrator in physiology at the College of Surgeons under Professor Noel-Paton, and her MD thesis on the dietary of students in halls of residence was a companion study to his work on the dietary of the working-classes. After holding

hton Royal, Dumfries,
eld, she returned to her
ogy. She also worked
ollege of Physicians of Edinburgh, and her methods of standardising suprarenal preparations was published in the *Proceedings of the Royal Society of Edinburgh.* In 1909 she was appointed medical officer to the Carnegie Dunfermline Trust, then pioneering in the medical examination, treatment, and
physical traini
officer to the
teachers, she se
ons to study ch
and America. In 1914 I
Government Board as an assistant inspector, but soon afterwards was seconded to the War Office to act as controller of medical services of the WAAC. She returned to civilian life in 1919 as a medical officer to the new Ministry of Health and was appointed senior medical officer in 1936. Inevitably much of her later writing was fused in official reports. She was responsible for t
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mate
also took
part
published
in 19
stetricians
invited her to become a member.

es: "Level-headed and balanced in judgment, Dr. Cameror
found in women in the
was in some respects
had in full measure that Scottish caution which sometimes vexes those eager for quick decisions, but her judgment on matters great or small, when formed, carried great weight with those who knew her. Her self-control and reflection were derived from the stoical elements in her nature. Yet her massive common sense was blended with lighter qualities, and in the office—even when in later years 'a senior statesman,' a 'mother in Israel,' and confidant of many in their troubles—she was often among the gayest of an hilarious party. An older member of a large family, she retained to the end a very real interest
young people, and she was a true Scot in
clan. She read much, wrote long and
taining letters, and had a fine literary
f words. She loved natural beauty and
Lake District. She lost her home in the London blitz but faced the years that followed with the serenity of spirit with which she had met the trials and disappointments of her professional life."

Another friend says of her: "A woman of strong affections, she had a great gift of inspiring affection, and in a service in which personal criticisms are seldom left unexpressed I never remember hearing her spoken of except with affection and respect. Her generosity and kindness of heart were notable."

Medicine and the Law

Medical Board's Certificate Final

THE High Court decided last December a workmen's compensation case where a county-court judge had disagreed with the certificate of the medical board under the Coal Mining Industry (Pneumoconiosis) Compensation Scheme. Under this scheme, if the medical board certifies that the death or disablement of a workman has been caused by pneumoconiosis, or that, while not totally disabled, he is suffering from the disease to such a degree that it is dangerous for him to continue work in the industry and is for that reason suspended from employment, compensation is to be paid to the workman or his dependants as if the disease were (in the familiar language of the Workmen's Compensation Acts) an injury by accident arising out of and in the course of his employment. In *Chedgy v. Somerset Collieries Ltd.* the workman had been a miner for many years. A year ago the medical board examined him and certified that he was suffering from pneumoconiosis, that, though he was not thereby totally disabled, it was dangerous for him to continue working in the mine, and that they had suspended him from that work accordingly. They certified that the disease was as yet in an early stage and that the degree of physical impairment was moderate. They added a statement that the workman was, however, at present unfit for any work owing to conditions not associated with the disease. When subsequently Chedgy's application came before the county-court judge at Frome as arbitrator, the colliery company pleaded that his condition was due to causes unconnected with pneumoconiosis. There was conflicting medical evidence and ultimately the judge found the workman to be totally incapacitated from pneumoconiosis. The employers then appealed. The scheme declares that the certificate of the medical board issued in pursuance of its provisions is
of the matter therein certified;
had made a finding inconsistent
certificate.

The High Court accepted the contention of the appellant colliery company. If the medical board certified Chedgy to be partially incapacitated through pneumoconiosis and totally incapacitated through another cause, it was not for the county-court judge to say that
pneumoco
finality of
element in the scheme. The county-court judge had failed to treat it as final.

Presently, we may hope, a system of all-in insurance and rehabilitation will relieve the courts of these disputes about compensation for industrial diseases. Many of them, though perhaps not Chedgy's case, arise from the inherent awkwardness caused by the law's characteristic approach to the problem. Instead of making proper and direct provision for the victims of an industrial disease of gradual
preferred to pretend
physical injury of su
man's consequential adaptations and modifications, the rights of the parties are enveloped in an atmosphere of make-believe which the Minister of National Insurance must somehow clarify.

Appointments

OG, DPH: asst. gynæcological
s Hospital, Plymouth.
p. asst. MOH and asst. school

LRCPE, DCH: asst. MOH and

temp. asst. MOH for Ealing.

Bristol Royal Infirmary.—The following appointments to the honorary staff are announced:

surgeon;
SCARFF, G. R., MB EDIN.; FRCSE, ENT surgeon.

Notes and News

University of Oxford

On Dec. 23 the following degrees were conferred:

BM, BCh.—Mary R. Barker, *G. M. Colson, P. B. S. Fowler, *R. G. Howell, A. H. James, *A. A. Jefferson, *D. Leigh, *R. H. Marten, Lewis Parker, A. E. Preston, *Joan F. Scott, R. A. Sladden, *C. J. H. Starey, *R. M. T. Walker-Brash, P. West, and Margaret K. Wilder.

* In absentia.

University of Glasgow

On Jan. 13 the following degrees were awarded:

MD.—Thomas Anderson (with honours); H. W. Bowyer and T. McM. Curran (with commendation); R. D. Campbell.

MB, Ch. B.—A. R. Beaton, J. E. Bennett, Katharine N. Brittain, D. F. Bruce, J. P. G. P. Burnie, A. C. Connell, M. S. Crawford, W. A. Crawford, J. L. Crichton, William Cullen, W. J. A. Dobson, Agnes P. Downie, R. E. Evans, R. C. Forrest, Jack Freedman, Arthur Jamieson, J. L. Kelly, Lewis Kennedy, W. I. Kenyon, G. J. Ker, Robert Lindsay, R. McP. [illegible] MacArthur, J. B. Macmillan, T. P. Magee, [illegible] Napier, A. J. Nelson, I. A. Porter, G. B. Pr[illegible] J. T. Weir Robertson, S. J. T. Robertson, Janette C. Russell, Thomas Smart, J. R. Smith, Raymond Smith, Rose K. Smith, I. D. Stewart, J. B. Stirling, F. H. Stone, K. J. Whitelaw, T. C. Douay Whiteside, A. M. Williamson, Alexander Young.

The Brunton prize for the most distinguished graduate in medicine of the year was awarded to J. K. Watt, and the West of Scotland RAMC prize to C. M. Ross.

University of London

Dr. L. S. Penrose has been appointed to the Galton chair of eugenics at University College, and Mr. Claude Rimington, PH D, to the university chair of chemical pathology at University College Hospital medical school.

Since 1939 Dr. Penrose has been attached to the Ontario pro- [illegible] health. H[illegible] io Hospit[illegible] Ontario. [illegible] d from St. [illegible] owe medal [illegible] He obtained his MD Camb. in 1930 and three [illegible] Buckston Browne prize. As research medi[illegible] n Counties Institution at Colchester he made a special study of the influence of heredity on disease. His book on *Mental Defect* appeared in 1933 and his clinical and genetic study of the subject as a Medical Research Council report in 1938.

Dr. Rimington, who holds the degrees of Ph D Camb. and B Sc Lond., has been on the staff of the National Institute for Medical Research since 1937. He cooperated with Hamilton Fairley and Foy in investigations into blackwater fever and has also worked on [illegible] tions include articles on [illegible]

Royal Society of Medicine

On Thursday, Feb. 1, at the section of neurology, there is to be a discussion on acroparæsthesia, when the opening speakers will be Dr. Simon Behrman and Dr. Graham Weddell. On Feb. 2, at the section of otology, at 10.30 AM, Mr. C. S. Hallpike and Mr. T. E. Cawthorne will demonstrate the dilatation of the endolymph system, and Mr. A. J. Wright will read a paper on Menière's disease. On the same day at 2.30 PM, at the section of anæsthetics, there will be a discussion on anæsthetic explosions, and at the same hour at the section of laryngology Mr. E. D. D. Davis, Mr. W. D. Harmer, Mr. Lionel Colledge, Mr. M. Lederman, and Mr. W. L. Harnett will open a discussion on carcinoma of the larynx.

Royal Institution of Great Britain

The Friday evening discourses before Easter will include the following: Prof. F. Wood Jones, FRS, the mammalian toilet (Feb. 16); Prof. David Brunt, SC D, FRS, climate and human comfort (March 9), and Mr. J. Z. Young, the structure, degeneration, and repair of nerve fibres (March 16). These meetings will all begin at 5 PM. On Thursdays, Feb. 1, 8, 15, and 22 at 5.15 PM, Prof. James Gray, SC D, FRS, will speak on locomotory mechanisms in vertebrate animals, and on Tuesdays, March 6, 13, and 20 at the same hour Sir Henry Dale, OM, PRS, will speak on nerve-endings and chemical transmitters.

Society for the Relief of Widows and Orphans of Medical Men

At a meeting held on Jan. 3 with Dr. R. A. Young, the president, in the chair, it was announced that a legacy of £5000 has been received from Dr. C. Reid of Stafford. At Christmas £1100 was distributed in presents, each widow receiving £20. The half-yearly grants paid this month amounted to £1948. Membership is open to any registered medical man who at the time of his election is residing within 20 miles of Charing Cross. Full particulars from the secretary, at 11, Chandos Street, London, W1.

National University of Ireland

The degree of MD has been awarded to Prof. J. F. Cunningham, Dr. J. B. McArevey and Dr. P. T. J. O'Farrell, for published work.

A Gift from Colleagues

The Royal College of Surgeons in Ireland have sent 1 guineas to the fund of the Royal College of Surgeons England for the restoration of their college.

Biochemical Society

A meeting will be held at the [illegible] School, Ducane Road, Hammc [illegible] Feb. 3, at 11 AM.

Polish Medical Association in the United Kingdom

At 5 PM on Tuesday, Jan. 30, at BMA House, Tavisto Square, London, WC1, Dr. Andrew Topping will speak on t aims of UNRRA in the health field.

Films on Anæsthesia

The films in the Technique of Anæsthesia series (review in *The Lancet*, 1944, ii, 773) are distributed by the Fil Centre, 34, Soho Square, London, W1.

British Orthopædic Association

The Sir Robert Jones gold medal for 1944 has been awarde to Mr. F. G. St. Clair Strange for his essay on the maj [illegible] and disease. This was read [illegible] ancet of Jan. 6.

Nutrition and Catering

Prof. S. J. Cowell, FRCP, is giving ten lec[illegible] principles and large-scale catering to the [illegible] Caterers to Industry. The lectures take place at the Roy Society of Arts, John Street, Adelphi, London, WC2, o Fridays at 3 PM, and the first was given on Jan. 19.

Argentine Plastic Surgeon

Dr. Dellepiane Rawson, head of the special ward for plast and restorative surgery at the Hospital Rawson, Buen Aires, has arrived in this country for a six months' vis arranged by the British Council. He will be working in th Emergency Medical Services plastic surgery unit at Par Prewett Hospital, Basingstoke, with Sir Harold Gillies.

CORRIGENDUM.—In the paper by Manson-Bahr and Mug gleton (Jan. 20) the dimensions of the tyroglyphid eggs in th segmenting stage (p. 82, line 29) should be 0·1–0·12 × 0·07 mm

Births, Marriages, and Deaths

BIRTHS

DIXON.—On Jan. 13, the wife of Dr. G. Joly Dixon, of Grappenhal Cheshire—a son.

HOLFORD.—On Jan. 11, at Colchester, the wife of Surgeon Lieut.-Commander J. M. Holford, RN—a son.

KIRKHAM.—On Jan. 15, at Oxford, the wife of Captain Ray Kirkham, RAMC—a daughter.

LLOYD.—On Jan. 18, at Burton-on-Trent, the wife of Dr. M. Halder Lloyd—a daughter.

MARRIAGES

DUNN—APPLEBY.—On Jan. 15, at West Tarring, Sussex, James Raymond Dunn, captain RAMC, to Joan Margaret Alethea Appleby, ARRC, TANS.

FIELDSEND—ASTLE.—On Jan. 13, at Thorley, Allan Birtwistle Fieldsend, MB, captain RAMC, to Betty Sybil Astle, MB.

THURLOW—YATES.—On Dec. 8, at Secunderabad, India, Gre Weldon Thurlow, captain RAMC, to Patricia Yates.

DEATHS

BROWNE.—On Jan. 19, Sir Br[illegible]

CHATTERTON.—On Jan. 17, at [illegible] MD DUBL., FRCSI, lieut.-c[illegible]

FLOWER.—On Jan. 14, at Paignton, Arthur Frederick Ashbroo Flower, MRCS, aged 75.

GAUVAIN.—On Jan. 19, at Alton, Hants, Sir Henry Gauvai MD, M CHIR. CAMB., FRCS.

LOUDON.—On Jan. 15, at Hamilton, James Livingstone Loudo [illegible] aged 79.

[illegible] t St. Helier, Jersey, C.I., Francis Peake [illegible] rly of the Southern Rhodesian Medical [illegible]

[illegible], in London, Edward Smallwood, [illegible] Norwood, SE 27.

RICHARDS.—On Jan. 13, at Coventry, Henry Edward Sutherland Richards, MC, MD RUI, major RAMC, TT (retd).

WOOD.—On Jan. 14, Arthur Thorley Wood, MRCS, aged 84.

The fa [illegible] *to war* [illegible] *as an* [illegible]

COMPOUND FRACTURES IN WAR
1944

J. A. MacFarlane, OBE, MD TORONTO
COLONEL RCAMC; CONSULTING SURGEON, CANADIAN ARMY OVERSEAS

Because of its specialised structure, bone when infected gives rise to particular problems of treatment, often involving repeated operations over many months, and even years. The investigations made so far into the use of penicillin in the treatment of recurrent bone infection offer some promise of increased safety in such operations, but certainly the drug will not sterilise, except temporarily, a cavity which harbours infected dead bone. There is no panacea for osteomyelitis as a complication of compound fractures

In civilian practice, where for the most part such fractures are compounded from within, and early operation is undertaken, a good number may be regarded as simple fractures. The communication through the skin may be sealed off by sutures after suitable exploration has been carried out. Many successful series of cases have been reported featuring immediate closure with the added safeguard of a course of the particular sulpha drug in vogue at that time.

Compound fractures sustained in battle are the result of missiles of different size and speed traversing clothing and skin, and usually producing varying degrees of damage to soft tissue as well as the shattering of bone. All the conditions favouring severe infection are present—gross soiling by contaminated clothing and skin and [illegible] blood-supply. Such hazards [illegible]at, and the limb may have to [illegible] stages in order to save life. [illegible] however there is sufficient blood-supply, we are today in a position not only to save the great majority of limbs in which there is a compound fracture but also to ensure that union in reasonable position may be expected without gross infection.

In the early stages of this war many surgeons believed that, with the aid of sulphonamides both locally and generally, it was possible to deal with the soft tissue wounds associated with fracture by immediate suture. This was soon recognised as a fallacy, and early in the desert campaigns strong directives against immediate closure were issued by the consulting surgeons. Not even with the advantages of penicillin is it likely that we shall see the time when this method of treatment can be adopted with safety.

Trueta's teaching of wide exploration, adequate excision, and immobilisation with an open wound reduced the incidence of infection both of soft tissue and bone. In a group of 120 fractures among the Dieppe casualties, the incidence of osteomyelitis following Trueta's method was in the neighbourhood of 12%. In certain fractures, notably of the tibia, where the bone lacks muscular clothing, and in others where large amounts of muscle have been removed, a continuously open wound with a large area of bare bone at its base will almost certainly result in some degree of necrosis and chronic infection. In the more favourable case, granulations quickly grow out from healthy resting muscle and shut off the bone from invasion by organisms ever present in any open wound. Certainly the ideal means of protecting bone from infection is to cover it with muscle [illegible] It remains to inquire when that may be [illegible]nd at the same time safe; what physical or [illegible] aids are available; and how they should be [illegible] When during the course of treatment should [illegible]uction of the fracture be effected? How much [illegible]tress should be placed [illegible] to successful clos[illegible] These are the que[illegible] asking themselves ever since adequate amounts of penicillin have been available to the Army. It seems that we are in the midst of a revolutionary change in the treatment of one of the most difficult groups of injuries that occur in war. Military experience will be carried over into civilian practice, and modified to meet the needs of industrial and road accidents, which present somewhat different problems from the battle casualty.

Much experience has been gained during the last four years in the management of war wounds. Surgeons who, as young men, worked on the same problems during the last war, and are actively engaged in this one in a consultant or advisory capacity, are prone to suggest at times that little has been learned that is new, that the principles of rest and infrequent dressings were applied in the years of 1917 and 1918, that secondary sutures were carried out with success in those days without chemotherapy. Be that as it may, the great majority of military surgeons today have had to reach their present state of knowledge by experience in this war. Youth may always be forgiven for learning by its own experience rather than from tradition and history. The greater mistake would be a failure to recognise that there is no static position; that great achievement and progress towards the ideal should only be a stimulus to further effort.

In the field of [illegible] is (1) to save li[illegible] function, and th[illegible] the least possible loss of time and inconvenience. The saving of life sometimes demands the sacrifice of the limb at an early stage because of interference with vascular supply and attendant anaerobic infection. Life-saving measures, otherwise, are directed to the control of hæmorrhage and the replacement of blood loss. Measures for the treatment of shock in the forward areas have certainly never been provided in previous wars or in any army on such a liberal and effective scale as in the British Armies today.

INFECTION

Pathogenic organisms are present in all war wounds. Fortunately, if the body has a reasonable circulation, it has great powers of resistance—if that circulation is functioning without [illegible] handicaps are (a) dec[illegible]uid, (b) local interference [illegible] venous thrombosis, or a [illegible] damage. The first and most important duty of the surgeon, after he has remedied the effect of gross loss of circulating fluid, is to ensure that muscle devoid of blood-supply has been excised; that foreign material which is readily accessible in the wound has been removed; that tension is relieved and the limb is left at rest [illegible] maintaining [illegible] penicillin un[illegible] relieve the s[illegible] present at a [illegible] him to close t[illegible] down the variet[illegible] where he is to [illegible] adequate initial [illegible] to offer in pre[illegible] during the time which must [illegible] final treatment, but it is too early as yet to determine accurately and judicially their merit relative to good surgery.

FORWARD SURGERY

Compound fractures with severe soft tissue damage are considered as urgent problems for forward surgery in the same category as abdominal wounds. With the present [illegible] most battles of de[illegible] treatment. This is [illegible] it off temporarily or [illegible] force and meets wi[illegible] It has been [illegible] in the last year, both i[illegible] that on the forward [illegible]bility for successful tr[illegible] wounds are brought t[illegible] reasonable time.

Adequate early surgery implies [illegible]d careful [illegible]d that is [illegible]rticularly [illegible]plies the [illegible] danger of [illegible] later and [illegible] to be carried out at a general hospital. Adequate early surgery implies safe and efficient immobilisation of both the fracture and the soft tissues.

Chemotherapy.—Nearly every wounded soldier in the recent campaign has been given a routine course of sulphonamides by mouth, and in most cases the drug has been used locally after wound debridement. Since early in the summer, penicillin has been available in sufficient amounts to allow for its routine use in all compound fractures. Administration is initiated at the time of forward surgery, and continued through the lines of evacuation to the base hospital.

There should be only one dressing of the wound until the patient reaches a hospital where definitive treatment can be effected. (This involves an understanding of the professional policy by the administrative officers responsible for the lines of evacuation.) Ideal conditions for prompt and uninterrupted evacuation may on occasion be impossible because of the tactical situation.

DEFINITIVE SURGERY

With the first report of Florey and Cairns on the use of penicillin in the closure of war wounds, the possibility of a revolutionary change in the treatment of compound fractures became apparent. During last winter, in various Canadian hospitals both in Italy and in England, an effort was made to familiarise clinicians with the general technique of penicillin treatment. Various methods of usage in the closure of wounds were tried. By D-day it was decided to aim at the closure by delayed suture of as many compound fractures as possible. As experience increased the percentage of attempted closures increased. It was evident that, even if success was not attained in all, at least nothing was lost, there was no increased danger to life or limb.

During this past summer, the great majority of compound fractures reached hospitals in England within 6 days of wounding. The need for 24 hours rest was apparent. Usually this was the first occasion on which the patient had the comfort of a bed—up to that time he had lived on a stretcher. Usually the estimation of hæmoglobin indicated the need for whole blood transfusion. It has been noted that the whole post-operative course and success of healing is improved if the hæmoglobin can be brought up to 80% before the definitive surgery is done. Good X rays were made, and with these and the notes made by the forward surgeon the base surgeon planned his final treatment of the fracture and to some degree of the wound. (He cannot complete that plan until the patient is in the theatre, for this is the occasion of the first inspection of the wound itself.) Intramuscular penicillin was continued until the wound was inspected in the theatre, and for a variable period after the definitive treatment.

Following the removal of plaster in fractures of the lower extremity, particularly femurs, skeletal traction was instigated as a preliminary to further treatment. The fractured femur is [illegible] on an extension table and with Steinmann [illegible] the tibial tuberosity. Ex[illegible] the entire area of the thigh made available for inspection and treatment. Extension is the most important factor in reduction of the long bones. The nearer to accurate reduction the more easily will the clothing of muscle and soft tissue fall into place without tension.

Pathology.—Although cultures were taken as a routine, the gross appearance of the wound proved to be the most important feature on which to base the decision as to immediate closure, partial or complete. Favourable wounds are those in which (*a*) there has been little skin loss, (*b*) there is little or no œdema of the skin edges or subcutaneous tissue, (*c*) dead muscle has been previously excised completely, and (*d*) the removal of the dressing presents clean bleeding tissue with little exudate. Fascial tags and bits of aponeurosis covering muscle may need removing, because it is not always possible for the forward surgeon to estimate the degree of interference of blood-supply to these structures. If they are left they will result in failure of healing.

In other cases, where a large vessel has been sacrificed, death of muscle follows what seemed to the forward surgeon an adequate operation, and there is foul exudate in the wound. The bacteriological examination in such cases will frequently show anaerobes, but clinically the patient is not suffering from gas-gangrene. These wounds need a careful secondary debridement and a further period of rest and penicillin treatment before suture is undertaken.

Routine cultures have shown a surprising incidence of both pyococci and anaerobes in spite of what seemed to be adequate penicillin therapy. This is easily explained on the basis of a persistence of some tissue which is devoid of blood-supply. It does not however mean that penicillin is ineffective. Rather does it prove that penicillin will "freeze" off this infection from the body; and indeed [illegible] developed in a case [illegible] penicillin therapy.

Closure.—The favourable case will allow for apposition of the skin by *vertical mattress sutures of some strong* material such as 'Deknatol,' silk, or linen. Up to 6 or 8 days it will be unnecessary to undercut the skin because the edges have not become adherent to the underlying tissue. There will nearly always be some œdema of the muscle. Even with the fracture reduced, there may be considerable skin tension due to this œdema and accompanying skin retraction. It has been found that if the limb is carefully splinted after operation what under normal circumstances of wound closure is considerable tension may be justified, provided there is no blanching of the wound edges. No buried sutures are used except a ligature for the occasional vessel. No attempt is made to remove granulations or fibrin in this early stage (3–10 days). The simpler the operative procedure on soft tissue the better.

Drainage.—Only in cases with much dead space has drainage been used and then in a dependent site to allow for seepage of exudate for 48 hours. On the whole, penicillin used locally through tubes has not been reg[illegible]. Occasionally it has been used as an [illegible] to sterilise "dirty wounds." It[illegible] and favourable for closure it tends to favour the introduction and growth of coliform organisms. The most troublesome cases are those which develop sinuses due to the so-called non-pathogens.

Staged closure.—Where undue œdema prevents complete closure it can often be completed through a window in the cast if half the wound is sutured and the limb immobilised for a week. Relieving incisions parallel to the wound at a distance of 2–3 in. may facilitate closure of the main wound. Wisely planned skin flaps and shifts are being more and more used to bridge those difficult defects associated with compound fractures of the tibia. It is [illegible] the tibia, with so little covering of mus[illegible] border, is prone to die and thus harbour organisms which are immune to any sort of chemotherapy, if it is left uncovered for more than 7 days. This is also true of other structures, such as the tendons on the dorsum of the hand and foot. Every e[illegible] areas to cover exposed [illegible]. The principles of plasti[illegible] free skin-grafts, pedicle g[illegible] generally must be applied [illegible].

TREATMENT OF FRACTURE

The existing wound usually affords sufficient access for an examination of the fracture itself. The necessity for such an examination will depend on many factors—the X-ray evidence of large foreign bodies near the fracture site, the gross displacement of main fragments, the need for manipulation of the fragments into better position, and the general consideration of the wisdom or need for internal fixation. It is a mistake to remove any but the smallest fragments in a shattering fracture of the lower extremity. The fragment may be apparently without blood-supply, but in the early stages of treatment it may be successfully covered and serve as a framework for union. The removal of large fragments, particularly in a lower extremity, will result in a gap which may take months to bridge by bone-grafting. For the most part reduction is not a serious problem, for pull is much lessened by destruction of muscle. Moderate extension, varying degrees of manipulation, and firm fixation and support are the guiding principles.

In certain fractures—such as those at the upper end of the femur, some fractures of the forearm, and fractures into joints—good position cannot be obtained without some form of internal fixation. In an increasing number of cases of this sort there has been no hesitation, under what were considered favourable conditions of the wound, to use screws, plates, or stainless steel wire to maintain apposition and alignment. The wounds have been [illegible]

[illegible] danger is the too free use of screws and plates where they are not needed. Not more than 10% of compound fractures in war surgery should require such mechanical fixation.

Immobilisation.—The most satisfactory method of splintage in the immediate postoperative period is that which gives complete rest and adequate support not only to the fracture but to the wound. Successful healing to [illegible] of com-
plete rest [illegible] the most
useful ag [illegible] itlined in
the plast [illegible] may be
removed at 10 days to allow the surgeon to inspect the wound or do a further stage of closure.

There has been much discussion during the past six [illegible] about the virtues [illegible] in the treatment [illegible] mur. Those who advocate its use combine it with a certain amount of traction through a tibial tuberosity transfixion pin incorporated in the plaster, with the foot of the bed well raised. It probably fulfils the requirements of complete rest and adequate support of soft tissue more completely than any other type of fixation It has the limitations attendant on complete fixation of knee and ankle, with the risk of loss of alignment as the soft tissues shrink and the limb falls away from the walls of the splint in the later stages of treatment. However, if early and successful wound healing is a sine qua non of successful treatment of the fracture, there should be no hesitation to adopt plaster fixation in the early stages of the treatment. It may be replaced at the end of 3–4 weeks by balanced traction, without as a rule any prejudice to the ultimate result.

RESULTS

Both in the Italian theatre and in the military hospitals here in England it has been possible to close compound fractures with encouraging success when judged after a two-month period. It is true that final success can only be assured after a much longer period. It is however the present practice to return the major number of compound fractures to Canada as soon as they can reasonably be expected to undertake the journey with safety.

During October, 1944, in an attempt to determine with some accuracy the success of this experiment with delayed closure, Major C. Rapp undertook a survey of compound fractures in Canadian hospitals in England. Only those cases on which accurate notes and follow-up records were available for 8 weeks after operation were included. For the most part the cases were seen individually. At the end of that period success was judged by (1) primary healing, or (2) unquestioned healing of the soft tissues, including fascia, with small skin defects (i.e., bone completely "shut off.") Judged as failures were those in which a sinus transversing the deep fascia persisted, whether or not it reached bone, and of course all those in which there was continued [illegible]

[illegible] ses in which closure was attempted, 160 or
uccessful. In femurs, of which there were
ortion of successful results was 72·4%. In
of the humerus, 88·2%. In 44 fractures of the lower leg, 68%. In 23 fractures of the forearm, 91%. The most disappointing group was the severe fractures involving both bones of the leg. Here out of 14 cases only 7 were successful. The average interval between primary surgery and closure was 7·6 days.

The average amount of penicillin used in each case from primary surgery until completion of therapy was
1,150,000 units, exte
A little over half the
drugs extending ove
27 grammes. Since
tions have been un
surgical divisions and their figures tally closely with those given here.

[illegible] one group of 108 fractures
ccessful, while 11 were not
caped bone infection. This
comparison is not a fair one because it is immediately apparent that a certain number of severely infected cases were unfavourable for closing at any time. The figures do indicate however that in 90% of all the cases coming to that particular hospital closure was tried, and with 80% success. In this theatre a slightly higher percentage of fractures are closed with similar success.

DISCUSSION

There is little doubt that the general standard of treatment of compound fractures resulting from the injuries of war has been greatly improved in the past five years. This is borne out not only by a decreasing early mortality from this severe type of injury, but also by a well-marked decrease both in late mortality and in the amputation-rate as the result of sepsis. This saving of life and limb has increased the problems in the late treatment of limb injuries—the bridging of bone gaps, the repair of tendons and nerves, and the fusion of joints. But in the absence of sepsis there is great scope for reconstructive surgery.

We have witnessed in these five years a change from the closed plaster open wound treatment, by which most of the early war wounds were treated, to an era of delayed closure in over 90% of all compound fractures. The direct advantages are evident not only in the saving of life and limb but in the great reduction in hospital days. The problem of the majority of compound fractures becomes merely the treatment of a simple fracture. Instead of the large rigid scars which result from a mass of fibrous tissue in a granulating wound, the scar is soft, pliable, and healthy with a minimum of fibrous tissue. This is a matter of no small importance, particularly in the lower extremity.

There may be a tendency to ascribe increased success and the limitation of sepsis to chemotherapy. There is as yet little evidence that such is a correct assumption. In a recent unpublished report[1] from Italy equal degrees of success in delayed closure were attained in two groups [illegible]
and the [illegible]
apprecі-
the rate
has for-
early and adequate
urgeons everywhere
ly surgery and have
to the patient by
teams.

The lessons learnt from Trueta's experience in the Spanish Civil War have meant much. Early and [illegible]
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prevented fre-
he journey down
the lines of evacuation. There is no doubt that this in itself has les [illegible]

Penicillin [illegible]
impossible as
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at the base
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reveals [illegible] sms in the wound in
spite of [illegible] It is obvious that when given by the intramuscular route penicillin will not destroy organisms in any small bit of tissue devoid of blood-supply, but it probably can isolate such infection and prevent its spread to viable healthy tissues.

Penicillin has been the instrument through which the attention of surgeons has been called to the possibilities of delayed suture. It has given them assurance that, if infection does follow attempts at closure or the [illegible] by such procedures. With increasing experience of its use, and variation of method, there is still much to

be learned of its exact value and place in the treatment of all war wounds.

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[1] Report by Major John Hamilton, No 1 Canadian Research unit.

In surveying the generally good results of treatment, including the comparative success of delayed closure, due credit should be given to that enthusiastic band of younger surgeons who have laboured often amidst difficulties and danger to ensure that the first and all-important surgery has been promptly and skilfully done.

DECOMPRESSION FOR CHRONIC PROSTATIC RETENTION

CONTROLLED BY INTRAVESICAL PRESSURE

H. T. COX, M D CAMB., F R C S E
SURGICAL SPECIALIST (FULL-TIME; TEMP.), WITHINGTON HOSPITAL, MANCHESTER MUNICIPAL SERVICE

THE term chronic prostatic retention is used in this paper to include any case with painless but persistent bladder distension to the region of the umbilicus. Chronic prostatic retention should, on clinical grounds, be subdivided into the two main groups into which most cases naturally fall.

The clinical features presented by the first, and by far the larger, group are predominantly urinary—dribbling incontinence together with a large tense bladder usually reaching to or above the umbilicus. This dribbling incontinence is so incapacitating that the patient, unless too senile to be incapacitated, seeks advice early. The clinical history and duration of the bladder distension are therefore characteristically short with a diminished likelihood of secondary intrinsic renal involvement. The presenting symptoms of the second group are more general than local—loss of appetite and weight, vomiting, &c.—the bladder distension being discovered on routine examination. The absence of bladder symptoms in this second group inevitably increases the risk of renal damage because of the long delay between the onset of the bladder distension and its detection.

This paper deals mainly with group 1 retentions. In general terms the thesis is that group 1 retentions are best treated by a rapid decompression with withdrawals of increasing volumes of urine and controlled by the intravesical pressure. The traditional slow decompression has been reserved for group 2 cases.

To exclude the presence of pyelonephritis, which would obviously confuse the relationship between the intravesical pressure and blood-urea, cases with urinary sepsis producing a turbid urine throughout were omitted. Cases that had been catheterised before admission were also omitted for the same reason. The table shows the results obtained by this controlled decompression in group 1 cases with a raised blood-urea, and, with three exceptions, represents a consecutive series admitted to Withington Hospital in a period of ten months. Of the three patients excluded, two, aged 84 and 70, were admitted moribund with blood-urea readings of 190 mg. and 389 mg. per 100 c.cm., and only one had urinary sepsis with a consistently turbid urine.

RESULTS OBTAINED BY DECOMPRESSION CONTROLLED BY INTRAVESICAL PRESSURE IN 9 CONSECUTIVE CASES OF GROUP 1 RETENTION WITH RAISED BLOOD-UREA FIGURES

In only 1 case, no. 6, did the blood-urea subsequently rise

Case no.	Age (yr.)	Blood-urea (mg. per 100 c.cm.)				Duration of decompression (hr.)	Total urine withdrawn (oz.)
		Before decompression	Days after decompression				
			1st	2nd	3rd		
1	74	283	108	59	36	19½	195
2	84	206	99	63	49	5½	95
3	77	186	45	27	23	5	117
4	59	178	41	45	38	6	128
5	74	160	56	48	—	6½	95
6	62	160	158	—	66	5½	88
7	63	150	62	45	29	6½	64
8	62	84	43	52	46	3½	78
9	73	66	70	19	61	9½	85

INITIAL AND TERMINAL INTRAVESICAL PRESSURE

The first step in the investigation consisted in measuring and comparing the drop in intravesical pressure produced by the withdrawal of urine at the beginning and end of decompression. These results show that at the beginning of decompression in group 1 cases approximately 1 oz. of urine has to be withdrawn to *produce a pressure fall of 12 c.cm., while to produce* a similar fall at the end approximately 3½ oz. have to be withdrawn. From this it is to be expected that greatly increasing volumes of urine will have to be withdrawn during decompression in order to produce a decreasing intravesical pressure throughout. The fallacy of all constant withdrawal methods (e.g., 4 oz. hourly) in group 1 retentions, if their object is to produce a gradually decreasing pressure, is thus revealed.

The average initial intravesical pressure in acute retention was found to be 36 c.cm., in group 1 chronic retention 56 c.cm., and in three cases of group 2 retention 23 c.cm. Group 2 represents the lowest pressure group, and group 1 the highest, acute retention occupying an intermediate position. This difference in pressure has been taken to indicate a failed bladder tone in group 2, consistent with the long history of prostatic obstruction, and an increased tone in group 1, consistent with the shorter history and representing an attempt by the *bladder musculature to overcome the obstruction.* The bladder therefore shows no exception to the well-known sequence of muscle hypertrophy followed by failed hypertrophy in partially obstructed hollow viscera.

INTRAVESICAL PRESSURE IN RELATION TO DETRUSOR TONE AND RENAL OUTPUT

At the beginning of decompression, with the bladder distension at its greatest, the muscle-fibres are at their maximum stretch; at the end these fibres are at rest. The difference in the volume of urine which must be withdrawn at the beginning and end of decompression to produce a similar fall in pressure is due to differences in muscle tone conferred on the muscle-fibres by differ*ences of stretch. The detrusor tone therefore plays a* decisive but gradually diminishing rôle in determining the intravesical pressure throughout decompression.

The withdrawal of 4 oz. of urine produces a drop in pressure. This is followed as a constant normal cystometrogram finding (figs. 1–3) by a variable rise in pressure. This rise may be due to urine entering the bladder from the kidneys, especially when polyuria is marked; it may be due to partial recovery in muscle tone following a diminution in stretch; or it may be due to a combination of these factors. The effect of an irritable hypertrophied bladder alone in producing this pressure rise was demonstrated by a decompression on a case of retention with infected (possibly tuberculous) urine. The with*drawal of 4 oz. lowered the pressure from 40 to 25 c.cm.* Within three seconds the pressure had risen to its original figure of 40 c.cm. The rapidity of this rise was such as to exclude urinary influx as its cause.

Using the 4 oz. hourly method as a type, it is clear that a renal output above or below this figure will result in a retardation or acceleration of the rate of decompression. The greater the polyuria and the more marked the muscle tone the less the pretensions of the 4 oz. hourly method to reduce the intravesical pressure.

The fall in pressure on withdrawing 4 oz. of urine is, for equal degrees of bladder distension, much smaller in group 2 cases known to have a failed detrusor tone than in group 1. This difference in pressure fall, together with *the difference in initial pressure, provides a solid physiological* basis for, and an important means of determining or confirming, the distinction between the two groups. These two factors, variation in detrusor tone and renal output, occurring in varying degrees and association, lie at the root of most of the difficulties encountered in decompression in group 1 cases.

INTRAVESICAL PRESSURE THROUGHOUT DECOMPRESSION (GROUP 1)

The patients were observed for a period before decompression. Two blood-urea readings were taken,

one at the beginning and one at the end of this period, thus avoiding the false impression often presented by a single reading which cannot convey the idea of a rising or falling value; the urinary output was measured and the clarity or turbidity of the urine noted. A description of instructive cases follows.

CASE-RECORDS

Aged 94. Chronic retention with [illegible] days' dribbling incontinence.

Period of observation 24 hours, bladder 2 in. above umbilicus, very tense. Urine clear, output 6 oz. Blood-urea 94, rising to 120 mg. per 100 c.cm.

Decompression: Time 2½ days, 2 [illegible] ½ hourly for 2 hours, then 4 oz. hourly. Blood-urea at commencement 120 mg.; 24 hours after commencement 116 mg.; 48 hours after 120 mg., 60 hours after 110 mg. per 100 c.cm. In view of persisting high blood-urea and intravesical pressure, it was decided to empty the bladder suddenly. Decompression was therefore terminated at the end of 2½ days by emptying the bladder, withdrawing 40 oz.; 24 hours after the sudden emptying the blood-urea had fallen from 110 to 57 mg.; 24 hours later the blood-urea was 40 mg. per 100 c.cm.

The cystometrogram revealed three distinct and significant phases.

(1) During the first 4 hours there was a well-marked fall in intravesical pressure from 50 to 20 c.cm. produced by the withdrawal of 20 oz. of urine at the rate of 4 oz. hourly, and associated with an equally well marked fall in the blood-urea from 120 to 116 mg. per 100 c.cm. The period of observation shows a rising blood-urea, 94-120 mg. The first blood-urea after the commencement of the decompression (116 mg.) should therefore be compared with the computed rise without [illegible] ng.) and not with the actual (120 mg.). On this basis the [illegible] ts, as stated, a substantial fall [illegible] ravesical pressure.

(2) At the end there was a well marked fall in intravesical pressure from 15 c.cm. to nil, produced by the sudden withdrawal of 40 oz. of urine from the bladder and associated with an equally well-marked drop in the blood-urea from 110 to 57 mg. in 24 hours.

(3) In the intervening 56 hours—practically the whole of the 2½ days' decompression—there was a high intravesical pressure (20–15 c.cm.) and a high blood-urea (116–124–110 mg.) maintained in spite of an hourly withdrawal of 4 oz. The recorded drop in pressure from 20 to 15 c.cm. in 56 hours is far too small to affect the blood urea and for practical purposes may be ignored. Thus the withdrawal of 224 oz. at the rate of 4 oz. hourly produced no determining fall in the intravesical pressure and therefore no fall in the blood-urea.

Two important generalisations emerge. First, in the absence of a fixed or slowly reversible renal change the intravesical pressures determine and parallel the blood-urea figures, a substantial fall in the former producing a corresponding and rapid fall in the latter. Secondly, the conventional assumption must be put aside that withdrawal of urine at the rate of 4 oz. hourly (or other similar constant-withdrawal methods) produces, in this type of retention, a determining and continuous fall in intravesical pressure. The withdrawal of this amount of urine produces only the outward semblance of a decompression.

The clear conclusion to be drawn from this case is that a more rapid withdrawal than 4 oz. hourly would abolish the long hold-up in the decompression and result in a more rapid fall in the intravesical pressure and the blood-urea. The reason for the constancy of the bladder pressure in spite of the withdrawal of large amounts of urine is to be sought in those two factors already referred to—polyuria and detrusor tone.

Aged 84. (Case 2 in table.) Seven days' dribbling incontinence. Severe œdema both legs, scrotum and penis. No evidence of uræmia. General condition extremely poor.

Period of observation 7 hours. Bladder ½ in. above umbilicus, very tense. Urine clear, output 3 oz. Blood-urea 218 and 206 mg. per 100 c.cm.

Decompression.—In view of the last cystometrogram findings the time was cut down, the decompression being terminated arbitrarily after 5½ hours; 4 oz. hourly for 2 hours, and 4 oz. half-hourly for the remaining 3½ hours. Bladder was then emptied by allowing its contents (55 oz.) to run out through the catheter. The three 24-hour periods after decompression showed a urinary output of 178, 138 and 118 oz.

Pathological report on prostate successfully removed by transurethral prostatectomy: "Anaplastic carcinoma of the prostate." X ray showed: "Secondary deposits in lumbar spine and pelvis."

The pressure at the beginning of decompression was 60 c.cm., at the end of the first hour 46 c.cm. and at the end of the 2nd hour still 46 c.cm.—the beginning of the same hold-up that dominated the last decompression. Furthermore, during the 2nd hour an additional factor was observed to come into play, strong detrusor contractions. These took the form of three major contractions with a pressure rise to 71 c.cm., accompanied by severe vesical pain and numerous painless sustained contractions with a pressure rise up to 59 c.cm. Taking into account these numerous contractions there was clearly a rise in intravesical pressure during the 2nd hour of decompression. In order to induce a drop in pressure the rate of decompression, as already stated, was then doubled by withdrawing 4 oz. half-hourly. The 55 oz. at the end of decompression was withdrawn in amounts of 20 oz. After the first 20 oz. there was a rise in pressure up to 44 c.cm. as the result of a strong detrusor contraction with severe vesical pain. The pressure remained at 40 c.cm. after the second 20 oz. had been withdrawn, then fell to 23 c.cm., at which figure it remained for 2 minutes. These high pressures recorded at the end of decompression are further evidence of an extremely active detrusor tone.

The term "slow decompression" for cases of this type is a misnomer. When the process is slow the decompression is inadequate and when there is an adequate decompression it is not slow. As long as there is an appreciable amount of urine in the bladder, the active detrusor tone maintains a high pressure necessitating the withdrawal of large amounts of urine and a rapid decompression. In cases such as this, therefore, with an active renal excretion, the question arises not only whether a slow decompression (a gradual reduction in intravesical pressure) is desirable but whether it is even possible.

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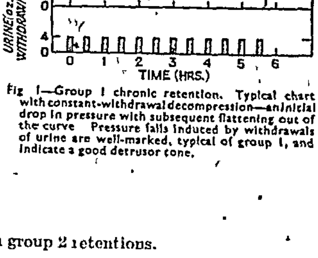

Fig 1—Group 1 chronic retention. Typical chart with constant-withdrawal decompression—an initial drop in pressure with subsequent flattening out of the curve. Pressure falls induced by withdrawals of urine are well-marked, typical of group 1, and indicate a good detrusor tone.

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Aged 62 (case 6 in table). Nine months' dribbling incontinence. Severe œdema of both legs for 10 weeks. Blood-urea 160 mg. per 100 c.cm.

Period of observation 24 hours. Urinary output 86 oz. with frequent passage of 3 oz. at a time. Bladder just above umbilicus.

Decompression (fig. 1).—4 oz. half-hourly for 5½ hours, then 40 oz. The chart is typical of a constant-withdrawal

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The clinical picture of bladder distension above the umbilicus with dribbling incontinence, prostatic obstruction and a blood-urea of 206 mg. per 100 c.cm. suggests serious renal impairment. But in view of the ability of the kidneys to reduce the blood-urea from 206 to 40 mg. in 3 days, this view may well be revised. It is clear that either there was no secondary intrinsic renal change or if such a change existed it was a rapidly reversible one.

The rapidity with which a raised blood-urea returns to normal after a controlled decompression is, within rational limits, a more efficient index of renal function than the height to which it is raised.

These rapid decompressions are sometimes followed by a faint bright red hæmaturia. This occurs at a time when the blood-urea is falling rapidly and has not been associated with any deterioration in the patient's general condition. It is in a totally different category from the dark red hæmaturia associated with a rising blood-urea and known to occur in too rapid decompressions in group 2 retentions.

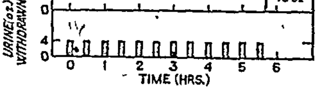

Fig 1—Group 1 chronic retention

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In only 1 case, no. 6, did the blood-urea subsequently rise

Case no.	Age (yr.)	Blood-urea (mg. per 100 c.cm.)				Duration of decompression (hr.)	Total urine withdrawn (oz.)
		Before decompression	Days after decompression				
			1st	2nd	3rd		
1	71	283	108	59	36	19½	195
2	84	206	99	63	49	5½	95
3	77	186	45	27	23	5	117
4	59	178	41	45	38	6	128
5	74	160	56	48	—	6½	95
6	62	160	158	—	66	5½	88
7	63	150	62	45	29	6½	64
8	62	84	43	52	46	3½	78
9	73	66	70	49	61	9½	85

INITIAL AND TERMINAL INTRAVESICAL PRESSURE

The first step in the investigation consisted in measuring and comparing the drop in intravesical pressure produced by the withdrawal of urine at the beginning and end of decompression. These results show that at the beginning of decompression in group 1 cases approximately 1 oz. of urine has to be withdrawn to produce a pressure fall of 12 c.cm., while to produce a similar fall at the end approximately 34 oz. have to be withdrawn. From this it is to be expected that greatly increasing volumes of urine will have to be withdrawn during decompression in order to produce a decreasing intravesical pressure throughout. The fallacy of all constant withdrawal methods (e.g., 4 oz. hourly) in group 1 retentions, if their object is to produce a gradually decreasing pressure, is thus revealed.

The average initial intravesical pressure in acute retention was found to be 36 c.cm., in group 1 chronic retention 56 c.cm., and in three cases of group 2 retention 23 c.cm. Group 2 represents the lowest pressure group, and group 1 the highest, acute retention occupying an intermediate position. This difference in pressure has been taken to indicate a failed bladder tone in group 2, consistent with the long history of prostatic obstruction, and an increased tone in group 1, consistent with the shorter history and representing an attempt by the bladder musculature to overcome the obstruction. The bladder therefore shows no exception to the well-known sequence of muscle hypertrophy followed by failed hypertrophy in partially obstructed hollow viscera.

INTRAVESICAL PRESSURE IN RELATION TO DETRUSOR TONE AND RENAL OUTPUT

At the beginning of decompression, with the bladder distension at its greatest, the muscle-fibres are at their maximum stretch; at the end these fibres are at rest. The difference in the volume of urine which must be withdrawn at the beginning and end of decompression to produce a similar fall in pressure is due to differences in muscle tone conferred on the muscle-fibres by differences of stretch. The detrusor tone therefore plays a decisive but gradually diminishing rôle in determining the intravesical pressure throughout decompression.

The withdrawal of 4 oz. of urine produces a drop in pressure. This is followed as a constant normal cystometrogram finding (figs. 1–3) by a variable rise in pressure. This rise may be due to urine entering the bladder from the kidneys, especially when polyuria is marked; it may be due to partial recovery in muscle tone following a diminution in stretch; or it may be due to a combination of these factors. The effect of an irritable hypertrophied bladder alone in producing this pressure rise was demonstrated by a decompression on a case of retention with infected (possibly tuberculous) urine. The withdrawal of 4 oz. lowered the pressure from 40 to 25 c.cm. Within three seconds the pressure had risen to its original figure of 40 c.cm. The rapidity of this rise was such as to exclude urinary influx as its cause.

Using the 4 oz. hourly method as a type, it is clear that a renal output above or below this figure will result in a retardation or acceleration of the rate of decompression. The greater the polyuria and the more marked the muscle tone the less the pretensions of the 4 oz. hourly method to reduce the intravesical pressure.

The fall in pressure on withdrawing 4 oz. of urine is, for equal degrees of bladder distension, much smaller in group 2 cases known to have a failed detrusor tone than in group 1. This difference in pressure fall, together with the difference in initial pressure, provides a solid physiological basis for, and an important means of determining or confirming, the distinction between the two groups. These two factors, variation in detrusor tone and renal output, occurring in varying degrees and association, lie at the root of most of the difficulties encountered in decompression in group 1 cases.

INTRAVESICAL PRESSURE THROUGHOUT DECOMPRESSION (GROUP 1)

The patients were observed for a period before decompression. Two blood-urea readings were taken,

one at the beginning and one at the end of this period, thus avoiding the false impression often presented by a single reading which cannot convey the idea of a rising or falling value; the urinary output was measured and the clarity or turbidity of the urine noted. A description of instructive cases follows.

CASE-RECORDS

Aged 94. Chronic retention with 4 days' dribbling incontinence.

Period of observation 24 hours, bladder 2 in. above umbilicus, very tense. Urine clear, output 6 oz. Blood urea 94, rising to 120 mg. per 100 c.cm.

Decompression: Time 2½ days, 2 oz. ½ hourly for 2 hours, then 4 oz. hourly. Blood-urea at commencement 120 mg.; 24 hours after commencement 116 mg., 48 hours after 120 mg., 60 hours after 110 mg. per 100 c.cm. In view of persisting high blood-urea and intravesical pressure, it was decided to empty the bladder suddenly. Decompression was therefore terminated at the end of 2½ days by emptying the bladder, withdrawing 40 oz.; 24 hours after the sudden emptying the blood-urea had fallen from 110 to 57 mg.; 24 hours later the blood-urea was 40 mg. per 100 c.cm.

The cystometrogram revealed three distinct and significant phases.

(1) During the first 4 hours there was a well-marked fall in intravesical pressure from 50 to 20 c.cm. produced by the withdrawal of 20 oz. of urine at the rate of 4 oz. hourly, and associated with an equally well marked fall in the blood-urea from 120 to 116 mg. per 100 c.cm. The period of observation shows a rising blood-urea, 94–120 mg. The first blood-urea after the commencement of the decompression (116 mg.) should therefore be compared with the computed rise without decompression (perhaps 150 mg.) and not with the actual figure preceding decompression (120 mg.). On this basis the blood-urea of 116 mg. represents, as stated, a substantial fall consistent with the drop in intravesical pressure.

(2) At the end there was a well marked fall in intravesical pressure from 15 c.cm. to nil, produced by the sudden withdrawal of 40 oz. of urine from the bladder and associated with an equally well-marked drop in the blood-urea from 110 to 57 mg. in 24 hours.

(3) In the intervening 56 hours—practically the whole of the 2½ days' decompression—there was a high intravesical pressure (20–15 c.cm.) and a high blood-urea (116–124–110 mg.) maintained in spite of an hourly withdrawal of 4 oz. The recorded drop in pressure from 20 to 15 c.cm. in 56 hours is far too small to affect the blood-urea and for practical purposes may be ignored. Thus the withdrawal of 224 oz. at the rate of 4 oz. hourly produced no determining fall in the intravesical pressure and therefore no fall in the blood-urea.

Two important generalisations emerge. First, in the absence of a fixed or slowly reversible renal change the intravesical pressures determine and parallel the blood-urea figures, a substantial fall in the former producing a corresponding and rapid fall in the latter. Secondly, the con

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The clear conclusion to be drawn from this case is that a more rapid withdrawal than 4 oz. hourly would abolish the long hold-up in the decompression and result in a more rapid fall in the intravesical pressure and the blood-urea. The reason for the constancy of the bladder pressure in spite of the withdrawal of large amounts of urine is to be sought in those two factors already referred to—polyuria and detrusor tone.

Aged 84. (Case 2 in table.) Seven days' dribbling incontinence. Severe œdema both legs, scrotum and penis. No evidence of uræmia. General condition extremely poor.

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The term "slow decompression" for cases of this type is a misnomer. When the process is slow the decompression is inadequate and when there is an adequate decompression it is not slow. As long as there is an appreciable amount of urine in the bladder the active detrusor tone maintains a high pressure necessitating the withdrawal of large amounts of urine and a rapid decompression. In cases such as this, therefore, with an active renal excretion, the question arises not only whether a slow decompression (a gradual reduction in intravesical pressure) is desirable but whether it is even possible.

The clinical picture of bladder distension above the umbilicus with dribbling incontinence, prostatic obstruction and a blood-urea of 206 mg. per 100 c.cm. suggests serious renal impairment. But in view of the ability of the kidneys to reduce the blood-urea from 206 to 40 mg. in 3 days, this view may well be revised. It is clear that either there was no secondary intrinsic renal change or if such a change existed it was a rapidly reversible one.

The rapidity with which a raised blood-urea returns to normal after a controlled decompression is, within rational limits, a more efficient index of renal function than the height to which it is raised.

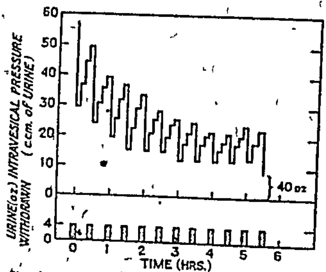

Fig. 1—Group 1 chronic retention. Typical

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Decompression (fig. 1).—4 oz. half-hourly for 5½ hours, then 40 oz. The chart is typical of a constant-withdrawal

be learned of its exact value and place in the treatment of all war wounds.

In surveying the generally good results of treatment, including the comparative success of delayed closure, due credit should be given to that enthusiastic band of younger surgeons who have laboured often amidst difficulties and danger to ensure that the first and all-important surgery has been promptly and skilfully done.

DECOMPRESSION FOR CHRONIC PROSTATIC RETENTION

CONTROLLED BY INTRAVESICAL PRESSURE

H. T. COX, M D CAMB., F R C S E
SURGICAL SPECIALIST (FULL-TIME; TEMP.), WITHINGTON HOSPITAL, MANCHESTER MUNICIPAL SERVICE

THE term chronic prostatic retention is used in this paper to include any case with painless but persistent bladder distension to the region of the umbilicus. Chronic prostatic retention should, on clinical grounds, be subdivided into the two main groups into which most cases naturally fall.

The clinical features presented by the first, and by far the larger, group are predominantly urinary—dribbling incontinence together with a large tense bladder usually reaching to or above the umbilicus. This dribbling incontinence is so incapacitating that the patient, unless too senile to be incapacitated, seeks advice early. The clinical history and duration of the bladder distension are therefore characteristically short with a diminished likelihood of secondary intrinsic renal involvement. The presenting symptoms of the second group are more general than local—loss of appetite and weight, vomiting, &c.—the bladder distension being discovered on routine examination. The absence of bladder symptoms in this second group inevitably increases the risk of renal damage because of the long delay between the onset of the bladder distension and its detection.

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The pressure at the beginning of decompression was 60 c.cm., at the end of the first hour 46 c.cm. and at the end of the 2nd hour still 46 c.cm.—the beginning of the same hold-up that dominated the last decompression. Furthermore, during the 2nd hour an additional factor was observed to come into play, strong detrusor contractions. These took the form of three major contractions with a pressure rise to 71 c.cm., accompanied by severe vesical pain and numerous painless sustained contractions with a pressure rise up to 59 c.cm. Taking into account these numerous contractions there was clearly a rise in intravesical pressure during the 2nd hour of decompression. In order to induce a drop in pressure the rate of decompression, as already stated, was then doubled by withdrawing 4 oz. half-hourly. The 55 oz. at the end of decompression was withdrawn in amounts of 20 oz. After the first 20 oz. there was a rise in pressure up to 44 c.cm. as the result of a strong detrusor contraction with severe vesical pain. The pressure remained at 40 c.cm. after the second 20 oz. had been withdrawn, then fell to 23 c.cm., at which figure it remained for 2 minutes. These high pressures recorded at the end of decompression are further evidence of an extremely active detrusor tone.

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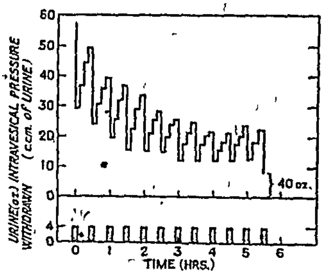

Fig 1—Group 1 chronic retention. Typical chart with constant-withdrawal decompression—an initial drop in pressure with subsequent flattening out of the curve. Pressure falls induced by withdrawals of urine are well-marked, typical of group 1, and indicate a good detrusor tone.

The rapidity with which a raised blood-urea returns to normal after a controlled decompression is, within rational limits, a more efficient index of renal function than the height to which it is raised.

These rapid decompressions are sometimes followed by a faint bright red hæmaturia. This occurs at a time when the blood-urea is falling rapidly and has not been associated with any deterioration in the patient's [illegible]

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Aged 62 (case 6 in table). Nine months' dribbling incontinence. Severe œdema of both legs for 10 weeks. Blood-urea 160 mg. per 100 c.cm.

Period of observation 24 hours. Urinary output 86 oz. with frequent passage of 3 oz. at a time. Bladder just above umbilicus.

Decompression (fig. 1).—4 oz. half-hourly for 5½ hours, then 40 oz. The chart is typical of a constant-withdrawal

decompression—an initial drop in pressure followed by a flattening of the curve. Blood-urea fell from 160 to 66 mg. in 3 days. On the 8th and 13th day blood-urea 104 and 98 mg. (first stage transurethral [illegible] normal micturition); on [illegible] urea 102, 85 and 71 mg. [illegible] tectomy); on the 50th [illegible]

In general terms, and apart from any question of intravesical pressure, the measure of the largest amount of urine passed during the period of observation, in this case 3 oz., provides a certain and safe guide for the initial withdrawal in the subsequent decompression. Another case, with the bladder 1 in. above the umbilicus and a blood-urea of 50 mg., passed 10 oz. of urine at one micturition and continued to pass large amounts during the period of observation. His blood-urea had fallen by next day to 37 mg. It is absurd, in this type of case, to insist on the withdrawal of such small initial amounts as 4–5 oz. unless one is willing to admit the equally absurd assumption that the patient's ability as well as his inability to pass urine is maintaining the high blood-urea.

The maintenance for some time after decompression of a high blood-urea (66, 104 and 95 mg.) indicates intrinsic renal damage. The history is the longest of the series—9 months dribbling incontinence—and therefore one most likely to be associated with secondary intrinsic renal damage. Once such renal damage has been produced by excessive duration of the retention, renal sepsis or pre-existing renal disease, to such a degree as to raise the blood-urea, no decompression however ideal can be expected to lower it to normal.

A "cold-punch" transurethral prostatectomy has been found to play an important part in the treatment of group 1 retentions, since it allows an early restoration of micturition and thus dispenses with the necessity for protracted bladder drainage.

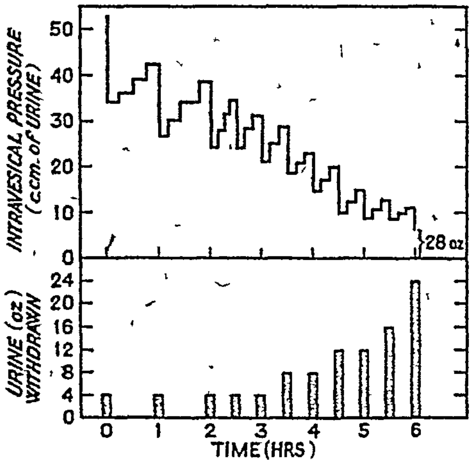

Fig. 2—Group I chronic retention. Chart illustrates that increasing volumes of urine must be withdrawn to produce a decreasing pressure throughout decompression.

Aged 77 (case 3 in table). Ten days' dribbling incontinence. Bladder 1 in. above umbilicus. Blood-urea 186 mg. per 100 c.cm.

Decompression.—The rise in intravesical pressure after withdrawal of the first 4 oz. was so well marked as to necessitate subsequent withdrawals at half-hourly intervals. This rate had to be doubled to 8 oz. half-hourly to induce a fall in pressure. The intravesical pressure was still at its original figure of 50 c.cm. after 2½ hours' decompression with a withdrawal of 20 oz. of urine. The decompression was terminated at 5 hours by withdrawing 45 oz. of urine. The postdecompression polyuria reached the high figure of 276 oz. in 24 hours.

Aged 59 (case 4 in table). Five days' dribbling incontinence. Bladder at umbilicus. Blood-urea 178 mg. per 100 c.cm.

Decompression (fig. 2).—This was dictated throughout by the intravesical pressure and shows a continuous fall in pressure produced by withdrawals of increasing amounts of urine.

Aged 74 (case 1 in table). Fourteen days' dribbling incontinence. Bladder at umbilicus. Urine clear. Tongue moist and clean. Blood-urea 283 mg. per 100 c.cm

Decompression (as in fig. 3).—The first distinctive feature in this chart is an absence of pressure rise (30–30 c.cm.) during the second hour. The pressure rise in the third hour was present but uncommonly small (23–26 c.cm.). Succeeding hours showed a gradual increase in pressure rise. The amount of urine (4 oz.) withdrawn being constant, the diminution or absence of a pressure rise is due either to failure of detrusor tone or to diminished renal output. But since the pressure falls of 60–38 c.cm. and 45–30 c.cm. for the first and second hours are large, and provide evidence of a good detrusor tone, these absent or diminished pressure rises are most rationally to be ascribed to absent or diminished renal output. This is quite consistent with a blood-urea of 283 mg. before decompression, the highest of the series, and one in the region of which renal failure may be expected to occur.

The pressure rise for the 4th, 5th and 6th hours exceeded the fall, thus producing a gradual increase in intravesical pressure. Doubling the rate of emptying to 4 oz. half-hourly did not diminish the rise in pressure, indicating the development of polyuria. The rate was again doubled to 8 oz. half-hourly, causing a definite drop in pressure. In view of the earlier anuria a rapid decompression was considered inadvisable and the decompression was therefore prolonged by cutting down the rate of emptying to 4 oz. half-hourly for a further 7 hours. It will be seen from fig. 3 that the withdrawal of 4 oz. hourly in the first 3 hours produced a falling intravesical pressure, whereas the withdrawal of double this amount subsequently produced a rising pressure. From this it is clear that a decompression that is based solely on amounts of urine withdrawn and not on intravesical pressure may well be misinterpreted and will certainly be misconducted.

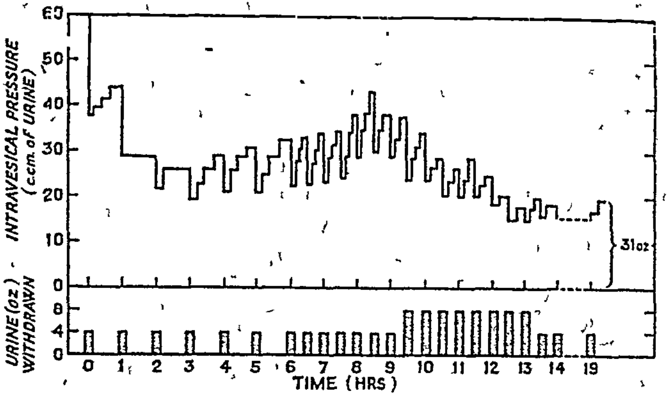

Fig. 3—Group I chronic retention. Chart shows an absence of pressure rise during the 2nd hour (taken to indicate a temporary anuria or oliguria), and an inconstant relation between the volume of urine withdrawn and the intravesical pressure. Withdrawal of 4 oz. hourly during the first 3 hours was associated with a falling pressure; withdrawal of 4 oz. hourly and half-hourly from the 4th to the 9th hour was associated with a rising pressure.

The use of the cystometrogram during the same decompression and with the bladder distended had unmasked the existence of an early anuria and a succeeding polyuria. This swing from anuria to polyu[illegible] requires an elastic method of decompression wi[illegible] constant changes in the amount of urine withdrawn.

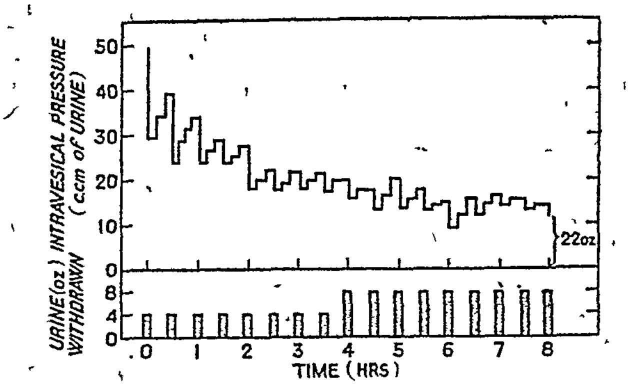

Fig 4—Mixed chronic retention. Chart shows small pressure falls (with the exception of the first hour) induced by withdrawals of urine, indicating a failure of detrusor tone (group 2). The more definite pressure falls of the first hour are to be ascribed to the recent increase in vesical distension with the onset of group I retention.

It should be again emphasised that the cases he[illegible] presented belong to group 1, had clear urine and had n[illegible] been catheterised before admission.

MIXED CHRONIC RETENTION

A group 1 retention may be superimposed on a gro[illegible] 2 retention. This mixed type may show a clinic[illegible] similarity to group 1—recent overflow incontinence wi[illegible]

not statistically significant. By the end of 96 and 144 hours in hospital, practically the same percentage had normal temperatures in both blood-level groups. In 10% of patients, even in spite of a high blood concentration, sulphapyridine was ineffective in reducing pyrexia.

(*b*) *Incidence of complications.*—Since delayed resolution is a relatively common complication of pneumonia, it is important to know if the blood concentration of sulphapyridine affected in any way the process of resolution. Table III shows clearly that delayed resolution occurs irrespective of the blood-level of sulphapyridine.

TABLE III—INCIDENCE OF DELAYED RESOLUTION, IN PATIENTS WHO RECOVERED, WHEN MEAN BLOOD-LEVEL WAS UNDER AND OVER 6·0 MG. PER 100 C.CM.

Mean blood-level (mg. per 100 c.cm.)	Cases	(With delayed resolution)	
		No.	%
6·0 and under ..	120	24	*20·0*
6·1 and over ..	31	7	*22·6*

The following mean levels were found in five patients who developed sterile pleural effusion—under 2·0 mg., two cases; 2·1–4·0 mg., one case; 4·1–6·0 mg., two cases. In three cases of empyema, one had a mean level under 2·0 mg., one between 2·1 and 4·0 mg., and one between 4·1 and 6·0 mg.

The number of patients among the 161 cases who developed complications is small, but it is noteworthy that the process of resolution appears to be unaffected by the concentration of sulphapyridine in the blood, and that sterile pleural effusion and empyema may occur in cases with relatively high blood-levels.

(*c*) *Final outcome* (*recovery or death*).—Table IV shows that an excellent rate of clinical recovery occurs in patients whose mean blood-level is not high. Of the 4 patients in the over 6·0 mg. group who died, 2 were critically ill at the time of admission and recovery was not expected; one of these patients died after 30 hours in hospital. The percentage difference (6·6) between the fatality-rates of the two groups has a standard error of ± 5·7 so that is not statistically significant.

TABLE IV—NUMBER OF CASES AND DEATHS AND FATALITY-RATE FOR MEAN BLOOD-LEVEL UNDER AND OVER 6·0 MG. PER 100 C.CM.

Mean blood-level (mg. per 100 c.cm.)	Cases	Deaths	Fatality-rate %
6·0 and under ..	126	6	*4·8*
6·1 and over ..	35	4	*11·4*

(*d*) *Effect of very low blood-level.*—It is interesting to note that in 17 patients the mean blood-level was less than 2·0 mg. per 100 c.cm. yet all recovered; these cases appear to be worthy of further consideration. Table V shows that infections of all types were included among them; 10 had a type II infection. Some were really ill—6 had bacteræmia and 5 were over 40 years of age, these including a man of 72 years with a type I infection having bacteræmia of 3 days' duration, and a man of 71 years with a type III infection. The duration of pyrexia was not lengthened by this low blood-level, for in 8 cases it did not exceed 48 hours and in 13 cases it did not exceed 96 hours. The complications encountered among the 17 patients included 2 cases of delayed resolution, 2 of sterile pleural effusion, and one of empyema. The incidence of delayed resolution was no greater than in those with higher blood-levels.

TABLE V—ANALYSIS OF 17 CASES WHOSE MEAN BLOOD-LEVEL DID NOT EXCEED 2·0 MG. PER 100 C.CM.

Type of organism	Cases	With bacteræmia	Age in year		Pulmonary involvement		Days of illness	
			Under 40	Over 40	1 lobe	2 or more lobes	Up to 3rd	After 3rd
I	4	2	3	1	2	2	0	4
II	10	4	7	3	7	3	5	5
III	1	0	0	1	1	0	0	1
IV	2	0	2	0	2	0	2	0
All types	17	6	12	5	12	5	7	10

DISCUSSION

The analysis shows that for recovery it is not essential to have a high concentration of the drug in the blood; there were n[illegible] 17 [illegible]ients of varying type infections [illegible] was under 2·0 mg. per 100 c.cm. Moreover, the fatality-rate was little different in those who had a high blood-level than in those whose blood-level was lo[illegible]. T[illegible] in the high blood-level group is [illegible] suggestive that no correlation [illegible] the blood-level and the final outcome of the disease (recovery or death), the duration of primary pyrexia, or the incidence of complications, in particular of delayed resolution.

It thus appears that th[illegible] effective when present in the [illegible] trations. This does not imp[illegible] drugs would safely be adopt[illegible] blood concentration varies considerably with standard dosage. The reason for this variation is not understood; no correlation was found with certain factors of the host (age, sex, and gastric acidity) or of the parasite (type of infecting pneumococcus and presence of bacteræmia). The day of beginning chemotherapy also had no effect on the blood concentration. The fluid intake does influence the concentration of the drug in the blood—patients whose intake is small tend to have high blood-levels, while a large intake is usually associated with a low blood-level—but even with a fairly constant fluid intake the blood concentration varies widely. It appears therefore that some people have a greater capacity to absorb the sulphonamide drugs from the small intestine than others. That being so, a lowering of the usual dosage is obviously not permissible. The results, on the other hand, do not seem to justify a more intensive course of chemotherapy to raise the blood concentration to a high level as a means of reducing further the fatality-rate in pneumococcus lobar pneumonia; there appears to be no need to exceed the usual 2 g. (or 4 g.) initially followed by 1 g. four-hourly.

A study of the blood-concentrations of the drug does not, therefore, reveal the cause of failures in the chemotherapy of pneumococcus pneumonia. Many patients are admitted to hospital at a late stage of the illness (after the third day) at which time chemotherapy is recognised to be less effective. It would appear possible to improve the results, especially in the type II infections prevalent in Glasgow, by earlier admission.

SUMMARY

The continuing high fatality-rate of type II pneumococcal infections in Glasgow (14·4%) suggests the need for improving therapy; a more intensive course of chemotherapy was considered.

The estimation of sulphapyridine blood-levels in 161 patients with pneumococcal lobar pneumonia shows that the results of therapy, as judged by the duration of primary pyrexia, the incidence of complications, and the final outcome of the disease (recovery or death) could not be correlated with the blood concentration of the drug.

A more intensive course of chemotherapy in pneumoni thus does not appear to be justified, and there appears t be no reason for exceeding the recognised dosage of 2 g initially, followed by 1 g. four-hourly.

I wish to thank Dr. W. M. Elliott, medical superintenden of Ruchill Hospital, for permission to publish these results and Prof. J. W. McNee and Dr. Thomas Anderson for advic and criticism in the preparation of this paper.

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expected a few days earlier. However, in war casualties delays in transport preclude uniformity of control. In the present series there were few readings between the 2nd and 5th day because of this delay; some cases were seen quickly after the injury, but others did not reach a chest centre for some days.

The behaviour of the fibrinogen content of the hæmothorax is illustrated in figs. 2 and 3. It will be seen that from virtual absence in the early stages, the percentage rises until in some cases it is higher than the blood-level after a week or so. No accurate interpretation can be based on these limited observations, but it may be inferred that an active serous exudate is produced. The conversion of the aspirated fluid from a "sol" to "gel" may be observed in some of the later specimens, while it is not seen in the early *aspirations* or otherwise when the fibrinogen content is low.

The significance of an exudate lies in the fact that a considerable quantity of fibrin may be deposited on the walls of the hæmothorax cavity. The process is progressive and it is found that the parietal pleura becomes lined by a much thicker layer (up to an inch) than the visceral surfaces (average about ⅛ in.). The essence of recovery from a hæmothorax is that the lung should reach the chest wall and obliterate any pleural cavity at the earliest moment. If fibrin develops before the pleural layers become apposed the closure is mechanically delayed. Once the fibrin layer has organised over the lung, it acts as a constricting barrier to expansion and encourages persistence of the dead-space. In addition the chances of infection are increased. If a hæmothorax is well and promptly treated fibrin layers do not have time to develop to any extent, but where evacuation is incomplete, or where excessive effusions occur, the risk of a fibrothorax is considerable. This means that even if infection is avoided the full re-expansion of lung is delayed and full respiratory function is not recovered. That is the inevitable state of affairs in hæmothoraces of appreciable size which are treated conservatively.

Penicillin used intrapleurally appears in some cases to have an irritant effect, and fibrinogen figures occasionally reach higher levels than usual when penicillin has been employed. Estimation of penicillin in aspirated fluid suggests that (using an intrapleural dose of 20,000 units) it is absorbed from the pleural surfaces within 24–36 hours. This applies to early cases where there is no appreciable fibrin deposit; an encysted fibrous pleural pocket may, however, retain active penicillin for a week or more.

CLOTTED HÆMOTHORAX

It has been assumed that blood in a hæmothorax always becomes liquid, but there are occasions on which definite clotting is observed. Massive clotting is comparatively rare, but forms in which substantial clot lies at the bottom of the fluid are more common. In the absence of infection the reason is probably a simple physical one. If blood is very slowly extruded into the pleural cavity there is little reason for much mechanical agitation within the thorax; as a result defibrination does not occur and the ordinary form of clot persists. This is most likely when there are pleural adhesions which help to limit the extent of the hæmorrhage.

The importance of this type of hæmothorax lies in the difficulties that arise in the course of treatment. The aspirating needle fails to yield more than a few c.cm. of fluid at a time before clot or fibrin obstructs the lumen. The same applies to any form of hæmothorax in which there are flakes of fibrin floating in the fluid mass, and a false interpretation must not be placed on what appears to be a "dry-tap." Strictly it is only to the very early cases of coagulation that the term "clotted hæmothorax" should be applied; the form of clotting that appears later is correctly designated by Nicholson and his co-workers as a hæmofibrothorax, and it is important to realise that the effect is produced far more by clotting of the reactionary exudate than by the coagulation of the original blood. Masses of fibrin stained with blood pigment lie in a cavity lined with steadily increasing layers of fibrous tissue. Evacuation of the debris through a small thoracotomy incision is the correct procedure in many cases, and to this decortication occasionally may be added. This latter operation involves removal of the encasing fibrous layer off the underlying lung. The plane of dissection is found surprisingly easily in most instances, and the lung once freed from its restricting influence shows ready signs of re-expansion. Considerable claims have been made for this procedure recently, but in my experience the benefits derived from it are limited.

CONCLUSIONS

Observations have been made on the changes that result from blood accumulating in the pleural cavity.

The blood may reach a volume of several pints and in the free pleural sac this clots normally, but is rapidly defibrinated. A liquid mass is formed in which fibrin shreds may be deposited. Fairly quickly a serous effusion develops and it is *this effusion* that accounts for the main deposit of fibrin that complicates the later picture.

Apart from the risk of infection, the sooner the *original* hæmothorax can be evacuated the better will be the chances of functional recovery.

Clotted hæmothorax is relatively rare, but coagulation of an effusion of high fibrinogen content gives rise to the clotted fibrothorax found in a proportion of cases.

It is in the presence of a clot—blood or fibrin—that active surgery may be required. A small thoracotomy allows the cavity to be cleaned and in selected cases permits removal of the restricting layer of fibrous tissue over the lung.

Breathing exercises are of great value in re-establishing full expansion of the collapsed lung.

DETERMINATION OF PLASMA MEPACRINE

A NOTE ON THE ANTICOAGULANT

FROM THE ARMY MALARIA RESEARCH UNIT

SEVERAL methods have recently been published for the determination of mepacrine in plasma (Brodie and Udenfriend 1943, Masen 1943). These authors recommend the use of "oxalate" as an anticoagulant, but it has now been found that if ammonium oxalate, or any salt mixture containing ammonia (e.g., Wintrobe's salt mixture) is used as the anticoagulant the amount of mepacrine found in the plasma is greatly increased.

The mean plasma mepacrine concentration of the patients from each of three hospitals has been determined by a modification of the method of Masen (1943). The table gives the mean plasma mepacrine concentration at the end of 48 hours' therapy—i.e., after 1·6 g. mepacrine. It is seen that there was no significant difference between the mean plasma levels of the patients of hospitals A and B, and that neither differed significantly from that of an experimental group of medical students and research-workers who had been given the same dosage under controlled conditions. The mean plasma level of patients from hospital C was, however, nearly three times as great. The difference was maintained throughout the whole of the therapy course. Wintrobe's salt mixture was used as the anticoagulant at hospital C. On changing the anticoagulant to potassium oxalate similar figures were obtained from this hospital also.

PLASMA MEPACRINE OF PATIENTS AFTER TAKING 1·6 G. MEPACRINE IN 48 HOURS

	No. of patients	Mean plasma mepacrine (µg/l)	SE mean
Hospital A	72	84	± 5
Hospital B	6	96	± 19
Hospital C	16	245	± 17
Experimental group ..	6	81	± 9
Hospital C (after changing oxalate)	4	88	± 10

In-vitro experiments have shown that the increase in plasma mepacrine concentration was due to the ammonia in the Wintrobe salt mixture. The ammonia presumably displaces mepacrine from the white blood-cells which have a high concentration of the drug (Brodie and Udenfriend 1943). It has also been shown that if

TREATMENT OF BURNS WITH PARTIAL SKIN DESTRUCTION

AN ILLUSTRATIVE CASE

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THE essential factor determining how a burn will heal is the presence or absence of destruction of the dermis. If the surface epithelium only is destroyed, without injury to the dermis, ra [illegible] from the epithelial follicular and [illegible] of the dermis should be the rule, provided that septic and other complications are avoided. But if the dermis is destroyed, then its hair follicles and skin glands are destroyed too, so that spontaneous epithelialisation can only occur from the periphery.

English plastic surgeons (McIndoe 1940) have from early in the war emphasised that the key to the treatment of these more severe cases is the earliest possible replacement of the destroyed skin by grafted skin. In cases in which the diagnosis of complete destruction of the skin is clear, primary excision and grafting results in the quickest healing, a procedure which modern chemotherapy has rendered feasible. More usually however grafting is not done until some weeks after the original burn, when the necrosed dermis has spontaneously separated and there is a healthy granulating surface. One of the principal reasons for this is the difficulty of recognising dermal destruction in the early stages. Recently methods have been suggested to aid such recognition. We have suggested the use of van Gieson's stain (picro-fuchsin) as an application to the raw area left after the removal of the blistered epithelium (Patey and Scarff 1944). The raw dermis without coagulation necrosis stains predominantly red, but with increasing amounts of necrosis it stains increasingly yellow. Dingwall (1943) has suggested for the same purpose intravenous injection of fluorescein and examination for fluorescence under ultraviolet light. Along some such lines as these it seems likely that a more accurate recognition in the early stages of the depth of skin destruction will be possible.

But it is an undue simplification to think of burns with skin destruction as falling into the two main types only; those with surface epithelial destruction without dermal damage re-epithelialising rapidly and uneventfully; and those with dermal destruction including the dermal epithelial structures in which skin grafting will be required. There are all degrees of coagulation necrosis of the dermis in burns. In a burn with only superficial necrosis of the dermis, the follicular and glandular structures are all present and capable of re-epithelialising the raw area. They cannot do so however until the superficial layer of coagulation necrosis has been cast off, a slow process accompanied by inflammatory and subsequent fibrotic changes in the dermis. The problem presented by this type of case has not been clearly posed. We are here reporting such a case which we have recently studied and which illustrates some of the points discussed above.

CASE-HISTORY

On July 27, 1944, a baker's roundsman, aged 41, was admitted to hospital with burns of the left hand and buttock sustained 2 days previously, when he fell asleep in bed with a cigarette in his mouth and woke up with the clothes on fire. On admission to hospital, the patient was anæsthetised and the burns examined under operation conditions. Most of the blistered skin had been removed the previous day when he had been treated as an outpatient in the casualty department. There were raw areas of exposed dermis covering most of the fingers of the left hand, particularly the backs, and to a slight degree the hand itself. Over the left buttock there was a similar raw area roughly circular in outline and approximately 7 inches in diameter. After they had been cleaned, both areas were swabbed with van Gieson's solution. The burnt areas of the hand stained red. The periphery of the burnt area of the buttock stained red, but the centre showed a light yellow tinge. The burn of the hand and the periphery of the burn of the buttock were therefore regarded as having sustained surface epithelial destruction only. The centre of the burn of the buttock was regarded as having sustained in addition superficial coagulation necrosis of the dermis. The burnt areas were insufflated with sulphathiazole-proflavine powder and covered with 'Vaseline' net, gauze, and wool. Subsequently a course of 'Sulphamezathine' (32 g.) was given by mouth.

The postoperative course was uneventful, and the first change of dressing was carried out under anæsthesia at the end of a week. The fingers and hand had almost completely epithelialised. The buttock wound had epithelialised at the periphery over a circular zone 1–1½ in. wide. The central portion was not epithelialised; œdematous epithelial islets could be seen regularly arranged in this area; between these the dermis was covered by a superficial layer of adherent slough. The area was treated by hypochlorite and subsequently by saline compresses, and the sloughs slowly disappeared, and were replaced by granulations; as this took place, the epithelial islets lost their œdema and the epithelium could be seen growing out from around them. By 4 weeks after the burn, the buttock showed the peripheral zone of primary re-epithelialisation thickened and approximating in appearance to the normal skin, while the central zone showed follicular epithelial islets still separated by granulations. By 5 weeks, most of the islets had joined and there were only a few areas of granulations. By 6 weeks, epithelialisation was complete.

DISCUSSION

This case illustrated a number of points in the diagnosis and healing of burns. The method of differential staining which we have suggested for the recognition clinically of coagulation necrosis of the dermis proved of value, and the diagnosis made in the primary stage of the depth of destruction in both the hand and the buttock was proved correct by the [illegible]

We have previously pointed out [illegible]ception of a plane of separation in the deeper layers of the epidermis leaving the interpapillary epithelial downgrowths (rete pegs) intact has no foundation in fact. The number and appearance of the epithelial islets in this case gives illustration of this point. They numbered approximately 80 to the square inch and their distribution corresponded very closely with that of the hair follicles in the surrounding healthy skin; the order of frequency of the rete pegs of course runs into many thousands to the square inch. Moreover, the re-epithelialising area had a characteristic goose-skin appearance, probably due partly to the œdema of the follicles and partly to contraction of the erector pilæ muscles.

Finally, this case poses the problem of the treatment of the burn with superficial necrosis of the dermis, but with the follicular and glandular epithelial structures of the dermis substantially intact. In a case of this type, all the factors for primary re-epithelialisation in situ are present, but epithelialisation cannot take place until the necrosed layers of dermis have separated. This is a slow process, taking in the present case 6 weeks. During this time, chronic inflammatory and fibrotic changes are taking place in the dermis, so that, when eventually healing is complete, the skin is left thicker and less supple than normal, and more likely to break down. The question arises whether in a case of this type the correct course, with modern chemotherapy and skin-grafting technique, is not to sacrifice the dermis, even though it contains the epithelial elements for regeneration, and to replace it by a skin-graft. By such means, in a favourable case, healing should be complete in a fortnight rather than 6 weeks, and the quality of the healing should be an improvement on natural healing.

CONCLUSION

Consideration of this case takes one step further the problem of the treatment of burns in cases with superficial dermal necrosis only. Even if it is shown that the burnt area is capable of re-epithelialisation from the deeper portions of the hair follicles left intact, expectant treatment is not necessarily the best, since immediate debridement and skin-grafting may give a better result in a shorter time.

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[illegible] missed. Only one case in [illegible] described.

We acknowledge our thanks to Messrs. John Taylor and Sons, managers of the Kolar Gold Field, for permission to publish this paper.

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COLD AGGLUTINATION IN TROPICAL EOSINOPHILIA

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BESIDES the usual isoagglutinins that distinguish the four blood-groups, there exist in many normal sera substances which cause clumping of red cells in the cold, and are therefore called cold agglutinins. In normal sera the reaction disappears above a dilution of 1 in 10, but in at least three diseases frequent high-titre values are obtained—namely, atypical pneumonia, trypanosomiasis, and paroxysmal hæmoglobinuria. After reading Turner's[1] article on the relation of cold agglutination to atypical pneumonia, we decided to carry out the same investigation in cases of tropical eosinophilia.

Sixty-six cases of tropical eosinophilia have come under our observation so far. We tested 105 sera for cold agglutination, of which 61 were from the cases of tropical eosinophilia; 53 out of the 61 sera gave positive cold agglutination, the titre varying from 1 in 16 to 1 in 2048; 27 of them gave high-titre values above 1 in 256. The significance of this consistently positive finding in tropical eosinophilia is still a matter for speculation, since the ætiology of the condition is still unknown. The pulmonary lesion, though miliary in nature, and the positive cold agglutination, suggest an ætiological similarity between this disease and atypical virus pneumonia.

The technique adopted for testing cold agglutination is given below and the results obtained are shown in the table.

COLD AGGLUTINATION RESULTS

Disease	Sera tested	Positive titres from 1/16 to 1/2048	Strong positive titres above 1 in 256
Tropical eosinophilia ..	61	53 (*87%*)	27 (*44%*)
Atypical pneumonia ..	5	4 (*90%*)	3 (*60%*)
Other diseases	39	13 (*33%*)	3 (*77 4%*)

Technique.—A 2–3% suspension of washed group O human corpuscles is made up in physiological saline. The test serum is diluted with saline in series from 1 in 4 to 1 in 2048, using Felix tubes and a home-made bulb pipette holding approximately 0·4 c.cm. With a Dreyer's pipette one drop of the red-cell suspension is placed in each tube. The contents are mixed by shaking the rack, which is then placed in the ice-chest (temperature about 8° C). Readings are taken the next morning soon after taking the rack from the ice-chest. The lower dilutions will show the cells bound together like a membrane and difficult to disintegrate. The higher dilutions will show fine but definite granules with slight clearing of the surrounding fluid. As the cells would have sedimented overnight the test-tube is flicked twice with the finger before the reading is taken. The tube showing visible granules to the naked eye is taken as the end-point and the dilution of the serum is its titre.

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[1] Turner, J. C., Nisnewitz, S., Jackson, E. B., Berney, R. *Lancet*, 1943, i, 765.

ROYAL SANITARY INSTITUTE.—At a meeting to be held at the institute, 90, Buckingham Palace Road, London, SW1, on Wednesday, Feb. 14, at 2.30 PM, Mr. T. Bedford, D SC, and Dr. J. G[illegible] Wilson will speak on the ventilation of dwellings.

Reviews of Books

Diseases of the Endocrine Glands

(2nd Ed[illegible]) [illegible] HERMANN ZONDEK, MD BERLIN. [illegible]RAUSNITZ, MD BRESLAU. (Arnold. Pp. 496. 40s.)

THERE are few parts of endocrinology which have not yet benefited from the researches of Professor Zondek, whose textbook has been republished after an interval of nine years—time for the first English edition to become out of date. It is welcome not only because it i[illegible] adequate [illegible] with accurate observation, but [illegible] emphasises the essential un[illegible] with general medicine. Implicit in almost every page is the teaching that no man can be a competent endocrinologist who is not a general physician, and that a[illegible] nows little or nothing of recent re[illegible] is a doctor in blinkers. Treatment of the subject is a little unequal—a weakness almost inevitable when one man attempts to cover so wide a subject. In the chapter on pluriglandular syndromes Professor Zondek's great capacity for synthetic thought seems to desert him, and the chapter on disorders of the generative system is sketchy and incomplete. The illustrations, numerous and well reproduced, sometimes seem hardly related to their legends; and the differe[illegible]onds's disease is not made cl[illegible]gh not entirely negligible, wei[illegible] the whole book.

The Modern Prison System in India

Lieut.-Colonel F. A. BARKER, CIE, MD CAMB., IMS retd, formerly inspector-general of prisons CP and Punjab. (Macmillan. Pp. 139. 10s. 6d.)

THE Indian Penal Code regulates under a uniform system of legal principles the lives of millions of people, living in communities with widely differing cultures and social structure. Colonel Barker describes the difficulties facing those responsible for giving effect to the ideas and principles which underlie the Code. His experience extended over thirty years of practical administration in the jails department, and the book indicates his broad and human outlook on the reformative aspects of the prison system and the aftercare of prisoners. Conditions differ in the various provinces of British India and in the Indian States; and of late years there have been difficulties associated with overcrowded prisons and political agitation. The high standard of health maintained in Indian jails may be attributed to preventive measures, including not only the destruction of flies, mosquitoes, and rats, but mass treatment of hookworm, inoculation against smallpox and cholera, and provision of a pure water-supply and a balanced dietary. Half the Indian prisoners increase in weight during their stay in prison; but though this speaks well for the food, labour, and medical care provided for them, it reflects adversely on the living conditions of the average Indian household.

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probable that cases are being missed. Only one case in a miner has previously been described.

We acknowledge our thanks to Messrs. John Taylor and Sons, managers of the Kolar Gold Field, for permission to publish this paper.

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COLD AGGLUTINATION IN TROPICAL EOSINOPHILIA

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BESIDES the usual isoagglutinins that distinguish the four blood-groups, there exist in many normal sera substances which cause clumping of red cells in the cold, and are therefore called cold agglutinins. In normal sera the reaction disappears above a dilution of 1 in 10, but in at least three diseases frequent high-titre values are obtained—namely, atypical pneumonia, trypanosomiasis, and paroxysmal hæmoglobinuria. After reading Turner's[1] article on the relation of cold agglutination to atypical pneumonia, we decided to carry out the same investigation in cases of tropical eosinophilia.

Sixty-six cases of tropical eosinophilia have come under our observation so far. We tested 105 sera for cold agglutination, of which 61 were from the cases of tropical eosinophilia; 53 out of the 61 sera gave positive cold agglutination, the titre varying from 1 in 16 to 1 in 2048; 27 of them gave high-titre values above 1 in 256. The significance of this consistently positive finding in tropical eosinophilia is still a matter for speculation, since the ætiology of the condition is still unknown. The pulmonary lesion, though miliary in nature, and the positive cold agglutination, suggest an ætiological similarity between this disease and atypical virus pneumonia.

The technique adopted for testing cold agglutination is given below and the results obtained are shown in the table.

COLD AGGLUTINATION RESULTS

Disease	Sera tested	Positive titres from 1/16 to 1/2048	Strong positive titres above 1 in 256
Tropical eosinophilia ..	61	53 (*87%*)	27 (*44%*)
Atypical pneumonia ..	5	4 (*90%*)	3 (*60%*)
Other diseases	39	13 (*33%*)	3 (*7·7%*)

Technique.—A 2–3% suspension of washed group O human corpuscles is made up in physiological saline. The test serum is diluted with saline in series from 1 in 4 to 1 in 2048, using Felix tubes and a home-made bulb pipette holding approximately 0·4 c.cm. With a Dreyer's pipette one drop of the red-cell suspension is placed in each tube. The contents are mixed by shaking the rack, which is then placed in the ice-chest (temperature about 8° C). Readings are taken the next morning soon after taking the rack from the ice-chest. The lower dilutions will show the cells bound together like a membrane and difficult to disintegrate. The higher dilutions will show fine but definite granules with slight clearing of the surrounding fluid. As the cells would have sedimented overnight the test-tube is flicked twice with the finger before the reading is taken. The tube showing visible granules to the naked eye is taken as the end-point and the dilution of the serum is its titre.

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1. Turner, J. C., Nisnewitz, S., Jackson, E. B., Berney, R. *Lancet*, 1943, i, 765.

ROYAL SANITARY INSTITUTE.—At a meeting to be held at the institute, 90, Buckingham Palace Road, London, SW1, on Wednesday, Feb. 14, at 2.30 PM, Mr. T. Bedford, D SC, and Dr. J. Greenwood Wilson will speak on the ventilation of dwellings.

Reviews of Books

Diseases of the Endocrine Glands

(2nd English edition.) HERMANN ZONDEK, MD BERLIN. Translated by CARL PRAUSNITZ, MD BRESLAU. (Arnold. Pp. 496. 40*s.*)

THERE are few parts of endocrinology which have not yet benefited from the researches of Professor Zondek, whose textbook has been republished after an interval of nine years—time for the first English edition to become out of date. It is welcome not only because it is an adequate expression of great learning combined with accurate observation, but because throughout it emphasises the essential unity of endocrinology with general medicine. Implicit in almost every page is the teaching that no man can be a competent endocrinologist who is not a general physician, and that a general physician who knows little or nothing of recent research in endocrinology is a doctor in blinkers. Treatment of the subject is a little unequal—a weakness almost inevitable when one man attempts to cover so wide a subject. In the chapter on pluriglandular syndromes Professor Zondek's great capacity for synthetic thought seems to desert him, and the chapter on disorders of the generative system is sketchy and incomplete. The illustrations, numerous and well reproduced, sometimes seem hardly related to their legends; and the differential diagnosis of Simmonds's disease is not made clear. These defects, though not entirely negligible, weigh little against the value of the whole book.

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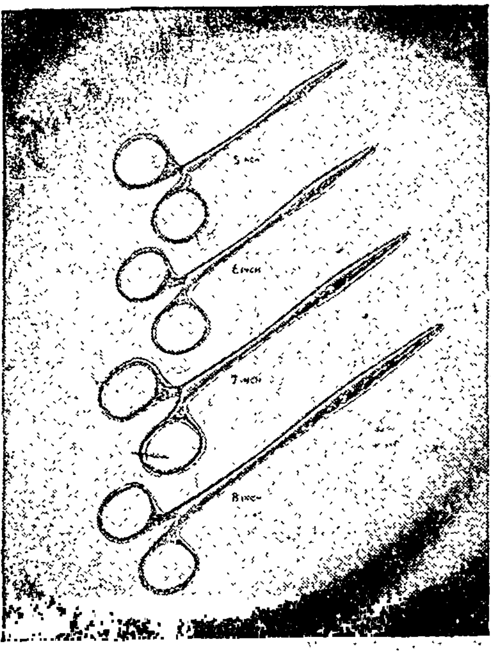

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THE LANCET

LONDON: SATURDAY, FEBRUARY 3, 1945

Gunshot Wounds of Bone

THE surgery of this war is good. The figures for deaths, for amputations, for [illegible] injuries, for gas gangrene, for healing of wounds and union of fractures, and for return to duty are better than they have been in any previous war. The reasons are to be found in the accessories of surgery rather than in surgery itself. Surgical principles have remained unaltered, and surgical skill has increased little; but surgical methods have developed to a remarkable extent between the two wars, and it is to these technical advances that the improvement must in large measure be attributed. The mortality of abdominal wounds in France is now not much more than half what it was in the last war, but this happy state is less the result of the excellent work of the field surgical units than of the smooth transport, expert resuscitation, forward hospital facilities which air cover has made possible, intravenous therapy, and gastric suction. Nevertheless in war, where the surgical services are good and are well administered, it is circumstances rather than methods that govern results. In other theatres of war, where changing circumstances approximate the conditions of warfare to those of 1918, the abdominal mortality is much on the 1918 level. Flesh wounds today are being closed by delayed primary suture with 90–95% success, and this achievement has been credited to penicillin and the sulphonamides; but in 1917, before the discovery of either, many surgeons in the BEF could report series of wounds closed by delayed primary suture with 90% success, suggesting that stable lines, early forward surgery, smooth transport, and well-equipped base hospitals are the decisive factors.

The early closure of compound fractures due to gunshot wounds is, however, something new, and something which before the advent of penicillin would never have been undertaken in the numbers and with the safety that are now recorded from many sources among the Allied armies. It is true that in the history of the last war several series are mentioned in which wounds complicated by fractures had been closed, but it cannot be claimed that the safety achieved or the success reported were sufficient to recommend the policy for wide adoption. Today, where military circumstances permit, closure by some form of suture or skin cover of all war fractures is coming to be regarded as one of the main objectives of the surgical services of an army. Gunshot fractures form the largest and most important problem in war surgery. They provide the great majority of the long-term cases—those who occupy hospital beds for long periods in the theatre of operations and call for large supplies of dressings; those who must be sent home and need trains, planes, and ships to send them there; those who require long aftercare; those who finally are unfit for service. They account for most of those who are permanently disabled to a greater or lesser extent, who remain pensioners and come into hospital again from time to time for further treatment. Successful early closure of gunshot wounds of the bones, by converting an open and contaminated fracture into a closed and uninfected one, will prevent complications and allow earlier, more certain, and stronger union. An open wound, however few and however innocuous the bacteria it may contain, however carefully it may be supervised, invites and in the end almost inevitably suffers invasion of pyogenic cocci. A fracture in communication with such a wound, though it may be uninfected in the early stages, almost invariably becomes colonised by any organisms that enter the more superficial parts. On the other hand, a wound closed by epithelialisation, whether the skin cover be provided by graft or by suture, though it may at first contain organisms, will soon sterilise itself by the action of the healthy tissue. A fractured limb with a healed scar becomes a relatively simple problem, and can be treated with a view to obtaining correct length and alignment and early union, without any modification of method dictated by the care of the wound. Large fragments, that in a septic wound would become sequestra, in a sterile one become chief grafts and accelerate union. Earlier union means earlier functional use and more useful ultimate function.

The proviso, "where military circumstances permit," is a necessary one; for, as MACFARLANE points out on another page, the closure of compound fractures in war demands adequate and early forward surgery, smooth and rapid transit to a holding hospital with no interference during the journey, and a planned routine whose every detail must be supervised by the surgeons responsible for suture. Where the fighting is heavy and continuous, where lines of communication are long and difficult, and during an advance or retreat, these conditions may be hard to fulfil. Adequate early surgery MACFARLANE defines as radical and careful exploration of the wound, removal of foreign material that is accessible by such an exploration, and excision of muscle that is not viable. Skin beyond the more bruised edges of the wound must never be removed, for it will be needed in closure; but it should be incised freely to allow an adequate exposure of the track. The wound and the fracture must be efficiently immobilised for transport, and this is effected in most cases by some form of plaster-of-paris splint, which has the additional merit of discouraging inspection during the journey. All wise surgeons are agreed that curiosity gives cocci their opportunity. Smooth transport of the casualties to a well-equipped general hospital where they can remain till their fractures are united is the second requisite. In Italy, where the possibilities of suture were first explored on a large scale, most casualties reach the base within 3–6 days. In the European theatre of operations, where a sea crossing is involved, the journey may take on the average a day or two longer, but the great majority of patients are in the hands of the surgeon who will see them through the later stages of treatment within a week.

The dressing applied at the primary operation should not be disturbed until it is removed under full aseptic precautions in the operating-theatre as a preliminary stage in closure. It is therefore essential that the surgeon should assess the patient and his wound as far as may be done without direct inspection. A study of the case-notes will indicate whether debridement was complete. Radiography through the plaster is always advisable, to indicate the kind of fracture that has to be dealt with, and to show whether there are any metallic fragments still to be removed; for it has been shown that foreign bodies near the fracture site are incompatible with smooth healing of a sutured wound. The blood-picture is investigated, and the patient is transfused with whole blood if his hæmoglobin is below 80%. Any but life-saving operations on the travel-weary should be avoided, and the 24 hours' rest which this assessment enforces is good in every way. In the operating-theatre the plaster is removed and the wound inspected with full surgical ritual. Bacteriological cultures are taken, but the decision to close is made on the appearance of the wound. It has been shown repeatedly that if the primary treatment has been thorough, and if the wound on exposure has clean bleeding surfaces, suture may be safely undertaken. Danger signs are the presence of gas or of pus in deep pockets, and œdema of the skin or surrounding parts.

The operation of closure is conducted on the simplest lines. Projecting tags of muscle or tendon that do not appear to be viable may be trimmed off with scissors, but as far as possible the wound surface is left alone. The skin edges may be freed from their bed with a blunt instrument, but are not undercut if this can be avoided. They are brought together by a series of vertical mattress stitches of some unabsorbable suture material. No buried sutures are used, but deep parts of the wound may be approximated by inserting a few figure-of-eight stitches among those that close the skin. There is usually a certain amount of tension in a wound thus sutured at the end of a week, even though little skin is missing. Where tension is due to traumatic œdema of the underlying muscles it will subside rapidly with closure and immobilisation, and the wound three or four days later will have lost its stretched appearance. Experience has shown that quite considerable tension, as long as the skin is not blanched, will do no harm except in wounds of the leg. Where the skin cannot be approximated by any means, or where closure leads to "tentage"—a roof of skin stretched over an underlying space—two-stage closure or skin flaps may be employed. The wound may be closed except for a few inches where the tension is greatest, and the site marked on the plaster case, so that it can be exposed after a week by cutting a window over it; if the remaining gap cannot then be closed by suture, which it usually can, it may be covered by a graft. Two-stage closure is applicable to wounds where the greatest skin defect does not overlie the bone. If such a step would leave the fracture side exposed, it is preferable to provide cover by the simplest available method of skin transference, as by releasing incisions which are immediately grafted, or by swinging a flap from one side. The last device is particularly applicable to fractures of subcutaneous bones. After closure, the fracture is treated secundum artem, usually by plaster-of-paris or skeletal traction. British surgeons in Italy and Canadian surgeons in the European theatre are freely using internal fixation for the fracture site. Their late results will be awaited with interest. The use of screws, wires, or plates, if it proves to be harmless, will undoubtedly make it easier to obtain anato-[illegible] and to secure early joint movement; but the more conservative may wonder whether the addition of a foreign body to the difficulties with which lacerated and contaminated tissues have to deal is not asking too much of the natural powers of resistance. FURLONG'S [1] figures for Italy, in which the femurs of the penicillin series, many of which were plated, showed a higher incidence of chronic sinuses than the non-penicillin series, none of which were plated, lend some support to this cautious attitude.

The results quoted by MACFARLANE from the wards of a group of Canadian hospitals in Britain are typical of those now being reported by many groups using similar but not identical methods and relying on penicillin as a safeguard against systemic infection. In the Canadian series of 200 compound fractures, 80% were successful; success implying either complete healing, or healing of the soft parts with a small skin defect, at the end of 8 weeks. As might be expected, the proportion of successful sutures varies with the bone: it is highest in the arm and forearm, intermediate in the femur where 72% were successful; and lowest in the leg. The leg has always been the surgeon's bugbear. Its skin has little subcutaneous fat and fits too tightly to allow any slack; for surgical purposes its fascia is dense and unyielding; its circulation has all the disadvantages of being at the periphery; its soft parts in the lower third are almost unrelieved tendon; and its main bone is subcutaneous throughout. That the Canadian surgeons are able to report 68% success in 44 sutured fractures of the bones of the leg is therefore all the more striking.

An Industrial Health Service

PROFESSION and public are wakening to the importance of industrial medicine, and many organisations and individuals are engaged in planning the industrial health services of the future. The latest plan comes from a committee of the Royal College of Physicians.[2] Its remark that these services should be planned "in a bold manner without much regard for traditional arrangements" will evoke wry comment from some of the people who have been working on the subject for many years without much encouragement: they may say that the traditions of industrial medicine, like those of royal colleges, are by no means always disadvantageous. But the committee's plan, if not the last word, is certainly a valuable basis for discussion.

An industrial health service, it believes, should be planned as part of the national health service, and closely associated with it at all levels—central, regional, and local. It should be national in its scope and apply to every variety of employment. It should be staffed by medical inspectors, consultants in industrial medicine, and whole-time and part-time medical officers, together with the non-medical personnel, all of whom should be trained for their particular work. In administration the service must be linked not only with the national health service but with university departments of industrial health, where such exist. Perhaps the most important recommendation is that clinical facilities, including hospital beds,

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1. Furlong, R., Clark, J. M. P. *Brit. J. Surg.* 1944, 32, 147.
2. Second interim report of the Social and Preventive Medicine Committee of the Royal College of Physicians of London. The members are Dr. A. A. Moncrieff (chairman), Lord Moran, Prof. M. Greenwood, FRS, Prof. A. W. M. Ellis, Dr. H. E. A. Boldero, Dr. J. A. Charles, Dr. P. M. D'Arcy Hart, Dr. Aubrey Lewis, Dr. Janet Vaughan, Sir Allen Daley, Dr. J. E. Gordon, and Prof. J. M. Mackintosh.

a long tradition, the Royal College of Physicians' committee has tackled a difficult problem, and its report might have taken a different turn if more of its members had been industrial doctors and more than one of the interested Ministries had been represented. One of its purposes, however, will be served if critics will now state their alternative solutions.

Hæmothorax

Blood in the pleural cavity is one of the commonplaces of war-time surgery. The amount lost in this way can be considerable, and a bigger internal hæmorrhage can be concealed in the pleura than in any other part of the human frame without necessarily causing death. In the treatment of hæmothorax there is one piece of good fortune that simplifies surgical treatment—the fact that it remains largely fluid, and therefore can be removed through a needle without great difficulty for the surgeon or great inconvenience to the patient. The reason for the fluidity of the blood has long been a subject for speculation. It is now being suggested that it does not arise from failure of the blood to clot when it is poured out into a serous-lined cavity, but rather that coagulation takes place normally and the rapid movements of heart and lungs defibrinate the blood. SUTTON points out in this case that hæmothorax blood a few hours after injury contains virtually no fibrinogen, and that its hæmoglobin content is 30–40% lower than that of the circulating blood. The inference is that defibrination occurs rapidly and completely, and that there is an early reactionary effusion. The precipitated fibrin is ultimately organised or absorbed into the walls of the hæmothorax cavity.

In most cases well-controlled needle aspiration can be used to evacuate a hæmothorax completely, leaving only a little local pleural thickening which clears up adequately with expansion breathing exercises. Shreds of clot and fibrin which block the aspirating needle can be removed through a thoracoscopy cannula, but in some cases a more massive local shadow on radiography suggests the presence of a clot which has to be evacuated through a small thoracotomy incision. Effective treatment of a more or less uncomplicated hæmothorax on these lines will produce an admirable functional recovery, as BARRETT emphasised in these columns last week.

There are, however, cases in which, through delayed treatment or added complications, an obvious massive clot is found in the pleural cavity. *This group demands adequate recognition.* There are several possible reasons for the unusual behaviour of the extruded blood. If blood is slowly poured out into the pleural cavity the movements of the thoracic viscera may be so little disturbed that defibrination does not take place. This is particularly likely when extensive pleural adhesions resulting from some previous disease or injury mechanically limit the size of the hæmorrhage. The resulting hæmatoma may then resemble an encysted hæmatoma in other parts of the body. This is the one true form of "clotted hæmothorax." The more usually designated clotted hæmothorax, recognised in the later stages, is strictly a clotted fibrinohæmothorax.[1] Here the irritative effect of blood on the pleural surfaces produces a serous effusion, which may attain a large size. The effusion dilutes the blood; hence the fall in hæmoglobin content observed by SELLORS in successive aspirations; it also causes the fibrinogen content of the fluid to rise after its original fall. Sometimes the fibrinogen content rises above the blood-level, suggesting that this is an active rather than a passive effusion. The effect of such a fibrinohæmothorax on the pleural cavity is often an extensive deposition of fibrin on the visceral and parietal surfaces, which seriously hinders obliteration of the space. In addition a mass of clot forms in the cavity which can only be removed by definitive surgery. Lately, evacuation has been supplemented by removal of the fibrin layer from the surface of the lung by decortication. In this operation the firm encasing layer of fibrin is peeled off the lung surface and cleared from the adherent edges between the lung, diaphragm, and parietes. LUSH and his colleagues[1] claim that rapid expansion can be obtained in this way and delay in convalescence avoided. The decortication can be assisted by the introduction of penicillin into the pleural cavity to overcome potential infection. Temporary drainage and aspiration must also be used to remove collections of bloodstained serum. This procedure has considerable possibilities.

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[1] Tosh, R. W., Stevenson, C. H., Nicholson, J. C., Nicholson, W. F. *Lancet*, 1944, ii, 467.

The treatment of hæmothorax, then, is no longer a conservative procedure aimed only at preventing infection. In its present form it comprises two parts: thorough and early evacuation of the pleural contents, and really vigorous attempts to restore full expansion of the collapsed lung by systematically planned breathing exercises. Even slight delay in emptying the pleural cavity may lead to a chain of events that seriously hinders functional recovery. The patient may be incapacitated for months instead of a few weeks.

Annotations

SAFETY IN THE HOME

ELABORATE provision is made by statute for safety in factory and workplace, where the people at risk are all adults. But the homes of the people are also workplaces. Dangerous apparatus is in daily use there, and many of those at risk are old and infirm, or young children. The housewife and her family need protection just as much as the worker, yet we neglect even the most elementary precautions for their safety. Unfortunately, as we descend the scale of housing standards the difficulties of the working housewife become more acute, until we sink to a positive death-trap in the house of one room. In small overcrowded homes the working-space is the only play-room for the children, and poor quality of fittings and apparatus increases the danger. The well-designed gas or electric cooker is too often mocked by a gas-ring which may be laid on the floor or any inflammable surface, and become a trap to the straying infant. In many homes the open fire is the sole means of cooking, and broken fire-bars are a frequent cause of accident. The law requiring the provision of fireguards is widely ignored (and at the present time these safety devices are almost unobtainable). The fireplaces installed in many cheap houses are ill constructed and dangerous when new, and may become deadly when allowed to fall into disrepair. Cooking utensils tell a similar story: many that look as if they were made to be upset are sold without stint; and clothing materials ready to catch fire from a spark find their way into the homes of the poor with no hint of their inflammability.

Little attempt is made to educate people about safety measures, and the result of our common negligence is that thousands of avoidable burning accidents occur every year in our homes. In this issue Dr. Marion Wright tells a plain story of fifty people who have been burned. Ignorance and gross carelessness are important contributory causes; and education and propaganda are obvious remedies. But bad housing, overcrowding, and lack of safety precautions are equally serious factors; it needs no statistical analysis to tell us what should be done.

DEXTRAN AS A SUBSTITUTE FOR PLASMA

FURTHER information has now appeared [1] concerning dextran, which has been claimed to be an efficient substitute for blood-plasma in transfusion. The substance is a neutral polysaccharide, consisting of a water-soluble high-molecular carbohydrate formed in solutions of sugar by the bacterium *Leuconostoc mesenterioides*. Its molecular weight may be many millions, but by partial hydrolysis preparations with molecular weights of 100,000–200,000 can be made, though these, like the original, are not homogeneous with respect to molecular weight. It is claimed that a solute can be prepared by partial hydrolysis which does not give rise to reactions or undesirable sequelæ even after repeated large infusions. The viscosity and colloidal osmotic pressure of the 6% solutions (with 1–3% sodium-chloride) which were used for experimental work were about the same as those of blood. After a single intravenous dose the dextran concentration in the blood of a dog falls gradually to zero in three or four days, during which time dextran of lower molecular weight than the original injection can be detected in the urine. There is no evidence of storage, even after repeated large infusions—an advantage over the otherwise efficient gum-saline solutions. Infusions are said to have rapid and lasting effects on the blood-pressure, heart action, and respirations of rabbits and cats subjected to bleeding, histamine shock, and contusion shock, while preliminary clinical trials have suggested that dextran is a better plasma substitute than gum-arabic, polyvinylpyrrolidone ('Periston'), or pectin. Dextran increases the sedimentation-rate in the same way as gum-arabic, and this makes determination of the blood-group a difficult matter.

An easily prepared and efficient plasma substitute would greatly relieve the strain on the blood-donor panel, and such a substance would not carry the ever-present menace of transmissible disease, due to a virus which not even filtration methods can remove. The assessment of dextran's claims, however, will need to be thorough and probably protracted before it can be said with confidence how far this carbohydrate is a complete substitute for natural blood proteins.

A NEW DPM

THE second interim report of the committee on psychological medicine of the Royal College of Physicians sets out proposals for the more thorough training of specialists in psychiatry. The committee note that the establishment of the present diploma in psychological medicine, in 1910, did much to raise the level of psychiatry; but they point out that the standard and scope of this diploma are relatively low, and they feel that the time has come to introduce a higher—or at all events, a more stringent—qualification. They hold that 3 years' clinical experience in appropriate departments and laboratories are essential before a man should be allowed to sit the examination; after that he should have 2 years' experience in whatever psychiatric field he chooses before he receives the title of the diploma.

In the committee's opinion no-one should start on his course for the new DPM until he has held appointments, including that of house-physician, in general or children's a water-soluble cream containing 1% of 'Cetavlon' and 3% of sulphanilamide. This is done with a knife-blade or spoon, with aseptic precautions; the operator's hands must be thoroughly washed and dried, and he should mask his nose and mouth. The burn is then carefully wrapped in sterile lint and a bandage, or in a clean towel; but if possible the cream should be removed within 2 days because of a slight risk of dermatitis.

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[1] Grönwall, A., Ingleman, B. *Nature, Lond.* Jan. 13, 1945, p. 45 See *Lancet*, Jan. 6, 1945, p. 24.

Gibson and Brown believe that loss of fluid usually continues for 24–30 hours. Adults with burns of more than 15% of the body surface, and children with burns of more than 5–10%, need transfusion of plasma or serum in amounts large enough to replace the fluid lost and prevent hæmoconcentration. Transfusion should begin as early as possible, and its rate should be controlled, throughout the shock period, by repeated blood estimations; the blood-pressure and pulse-rate are much less reliable; indeed the BP may be normal or high though hæmoconcentration has begun. Plasma can easily be given too quickly or in too great amount, particularly in children; and there is special danger of pulmonary œdema in patients who have inhaled hot gases or irritant vapours. Nevertheless "much larger amounts than hitherto recommended are often necessary," frequent observation and a nice clinical judgment being required to strike the happy mean. Until shock is overcome, local treatment should in most cases be confined to application of a first-aid dressing. "Blisters are snipped and a trickle of cetavlon solution is run over the whole surface, which is then covered with sheets of gauze," previously spread with the cream already mentioned. Complete cleansing and dressing are postponed till the 2nd or 3rd day.

The plenary treatment adopted at Glasgow relies largely on cleansing with the detergent antiseptic cetavlon, ordinarily without a general anæsthetic: "under the routine dose of morphine given to patients with severe burns, the cleaning-up process has usually caused little or no pain." After cleansing, a mixed sulphonamide cream is applied—the one now recommended containing sulphanilamide (3 g.), sulphathiazole (3 g.), glycerin (10 g.), castor-oil (25 g.), 'Lanette' wax sx (10 g.), and water (49 g.). The burn, which must be widely covered and firmly bandaged, is left untouched as a rule for 7–10 days, or even 12, unless the affected area is such that contamination is unavoidable. A little fever (up to 102° F) is in itself no indication for changing the dressing, for "such fevers are frequently reactions to injury." For routine use the Glasgow workers prefer to give sulphonamides locally rather than orally, and they "have a strong impression that the bactericidal effect we hoped for has to a large extent been achieved both by sulphanilamide and by sulphathiazole." But th[illegible]s able to establish itself [illegible] they think it unlikely tha[illegible] to guard the great majority of burns from infection throughout the long weeks of healing. What is necessary therefore is to reduce the opportunities for infection during treatment: "we must work out a system of preventive measures, analogous to those of the operating theatre [illegible] of the [illegible] but Colebrook and his colleagues also draw attention to a second big problem that awaits solution—how to deal with the severe protein depletion or other profound metabolic disturbance which so often now kills burnt patients after 3–6 weeks, and probably greatly delays healing in those who survive. Anderson and Semeonoff, in a valuable chapter on the chemical changes they observed, state that the loss of nitrogen in the urine, though large in some of the cases, was not as excessive as that reported by some of the American workers.[2] Badly burnt patients, however, could not

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[2] See *Lancet*, Jan. 20, p. 91.

A FACULTY OF OPHTHALMOLOGISTS

TOWARDS the end of the last war a Council of British Ophthalmologists was established, consisting of the presidents and past presidents of the Ophthalmological Society of the United Kingdom and of the ophthalmological section of the Royal Society of Medicine, together with 9 members elected annually, 4 each by the councils of these bodies and 1 by the council of the Oxford Congress. Later the master and the past masters of the Oxford Congress were added as permanent members and the number of elected members increased.

Recently it has been felt that the Council would have more authority if it were more directly representative of the whole body of ophthalmologists.

As part of a National Health Service the Government intends to establish an ophthalmic service. This raises questions not only of conditions of service, but of the relation of the ophthalmic practitioner to the dispensing and sight-testing opticians, the methods of spectacle supply, and the establishment and control of clinics. Moreover. the term "ophthalmologist" will have to be defined and the regionalisation of hospital services will require planning. In addition, education and research, clinic and hospital policy, industrial problems, and a host of other questions will assume importance in the immediate future.

It is thought advisable that the whole body of ophthalmologists should play a part in the institution of such policies as they affect their specialty, and should possess a mechanism to influence their development. The Council of British Ophthalmologists have therefore decided to promote the formation of a Faculty of Ophthalmologists whose functions will be :—

1. To take cognisance of, and to act in, any matters of ophthalmic interest.
2. To encourage suitable standards of education in ophthalmology for undergraduate and postgraduate students.
3. To encourage research in ophthalmology and cognate subjects.
4. To secure such conditions in ophthalmic practice as will attract persons of high professional attainments and afford ample scope for the exercise of their abilities.
5. To maintain a high ethical standard in ophthalmic practice.
6. To act as an authoritative body for the purpose of consultation in matters of public and professional ophthalmic interest.

It is proposed that the Faculty shall consist of members and associates. The following will be eligible for membership :

1. Ophthalmic surgeons to hospitals recognised as schools of ophthalmology by universities or other medical examining bodies.
2. Ophthalmic surgeons other than the above who have been engaged for at least five years in full-time practice as specialists and have charge of beds in voluntary hospitals approved by the Council. (Provisionally, these will be general hospitals of more than 200 beds and special ophthalmic hospitals of more than 20 beds.)
3. Persons no longer on the active staffs of hospitals who have held appointments specified in (1) and (2).
4. Other ophthalmic surgeons of consultant rank approved by the Council, including those in the Services or holding Government appointments.

Any ophthalmologist who has spent at least two years in full-time practice as a specialist (civilian or Service) will be eligible for election as an associate. Members will pay an initial subscription of three guineas and associates one of one guinea.

Executive powers will be vested in a council which, for the sake of continuity, will be known as the Council of British Ophthalmologists. This will have 21 members, of whom 15 will be elected by members and 6 by associates. When the new council is established it will assume all the function of the present Council of British Ophthalmologists, which will hand over all its records and any other property in its possession.

Forms of application for enrolment as members or associates may be obtained from the hon. secretary of the organising committee, Mr. Frank W. Law, FRCS, 45, Lincoln's Inn Fields. London, WC2.

Reconstruction

WILL SICKNESS CLAIMS INCREASE?

FOR how much post-war invalidity must we plan? Some commentators speak easily of reductions following the introduction of a National Health Service. But these cannot be assumed.

Statistically, each man is expected, on average, to claim benefits which vary with each year of age and which run from 0·61 week's sickness plus 0·26 disablement at age 24 up to 1·52 weeks' sickness and 1·80 weeks' disablement at 55, and 2·35 weeks' sickness and 5·40 weeks' disablement at 64. There are separate rates for women, distinguishing married women from the others.[1]

Curiously enough, contemporary man is expected to behave as his father or grandfather did 50 years ago; for the figures are calculated on what is called "Manchester Unity experience 1893–97" with a loading of 12¾% to provide "a necessary margin for cases where the liability is above the average. In cases where such a margin is not required it supplies a provision for additional benefits following the valuation."[2] And now the Government Actuary adds a further 12½% "having deemed it essential, in view of the fundamental changes from the existing scheme, to provide an appreciably higher claim rate than that prevailing hitherto." This expression of view, set out in his appendix to the white-paper on Social Insurance, corresponds to the same increase which he discussed at greater length in his appendix to the Beveridge report. He then said wisely:

> "While it is true that, as the result of the comprehensive health and rehabilitation service which is to be provided in place of the more limited existing medical benefit, a substantial improvement in the health of the community should be secured in due course, it does not necessarily follow that the cost of benefit will be correspondingly abated. This is due to the fact that under the altered arrangements there may be a tendency on the part of the doctors to require longer periods off work in order to secure complete recovery from the effects of an illness, and there will also be less incentive than in the past to return to work owing to loss of income."

He concludes "The position is definitely speculative . . ."

Sir William Beveridge in "A reconsideration of rates of contributions for social insurance" published in the *Times* of Jan. 9 appears now to argue against this latest loading and urges that contributions should be reduced in class I on this account "by nearly 2*d*. a week."

Two distinct issues arise. If it is accepted that the contribution should be drawn on "austerity" lines, with the express intention that the State should annually find the cash balance required, then no violent reaction need be expected; comments will turn upon one's general attitude towards the State and its finances. Between the two wars financial caution was the keynote; but in a transitional period, when the burden of taxes and contributions may hamper expansion, there may be good reason to avoid piling up unnecessary reserves and to accept within a flexible Budget the fluctuating balance of sickness expenditure. More especially could this be justified by the fact that the present Health Insurance Fund carries into the new scheme invested assets of the order of £245 million. This nest-egg comes from the system of actuarial valuation of each of the seven thousand separate approved societies and registered branches. It will be no longer needed when the bird disappears. For the nonce it is earmarked as capital; but when the cries have died down, a new Parliament may feel free to consume it.

If, on the other hand, the expectation of sickness is scaled down on the implied assumption that a National Health Service will reduce the volume of weeks' benefit—and that it will be blameworthy if it does not—then a note of warning should be sounded. Ratios of mental and physical efficiency cannot solely be measured by weeks of work lost. In lean times when savings were exhausted, sickness benefits were inadequate, and supplements carried the stigma of the poor-law, many a man has forced himself to attend at work in a condition when medical considerations—or sometimes humane con-alterations should have kept him at home on benefit. (We say "alternative work" advisedly, because employers and statisticians will bear witness how often a devoted foreman and sympathetic workpeople have covered the slackness of a sick workman "who couldn't afford to be ill.") [illegible] with [illegible] at [illegible] supervisors are increasingly identifying such cases; and the tendency will get less [illegible] when [illegible] transfer from the pay roll to [illegible] sickness [illegible] supplemented through [illegible] benefits. In a true scale of values this is all to the good [illegible] aggregate wealth. But that is not to say that in the nation's vast account books the fact that fewer are working [illegible] will find the liabilities decrease.

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[1] National Health Insurance Valuation Regulations, 1938, S R & O 281, p. 12.

[2] Cmd. 1662, p. 9.

It is often thought that as Beveridge says in his *Full Employment*, "the general improvement of health, which is lengthening the average total life of men, is not also helping to any extent to sustain their working capacity." But increased [illegible] increased periods of [illegible] capacity; [illegible] reductions in sickness attributed to a higher standard of health are masked by the longer periods of benefit drawn by invalids whose lives have been prolonged. There is little evidence that public opinion has yet caught up with the [illegible] who in 1937 [illegible] "Neither those who believe in a life after death nor those who do not can justify a heavy expenditure of talents and money [illegible] the earthly days of those who can never work again, unless they are satisfied that all necessary talents and money are already being devoted to the conservation of the highest degree of health for those who may still have many days before them."*

FOOD IN 1944

A YEAR ago we reproduced charts comparing the amounts of various foodstuffs made available per head of civilian population in the United States, Canada, and the United Kingdom in 1943 (*Lancet*, 1944, i, 609). Last year, despite expansion of military needs and large shipments to the Allies, food-supplies for civilians in the USA and Canada were in most cases maintained or increased, owing to greatly increased production. Supplies for civilians in this country also showed some improvement, but continued below prewar levels for many foods and below 1944 Transatlantic levels for dairy products, meat, eggs, sugar, and fruit. These findings are brought out in the second report just issued by the Combined Food Board.

In both the United States and Canada meat consumption in 1944 was nearly 50 lb. per capita more than in the United Kingdom. In contrast, the consumption of potatoes and flour has increased appreciably here during the war, and in 1944 potato consumption in the United Kingdom is estimated to have exceeded that of the United States by 140 lb. per head and that of Canada by 95 lb.

All three countries showed a general increase in consumption of fluid milk in 1944 as compared with 1943. In the United States and Canada meat supplies showed an increase, but evaporated milk decreased. Other important changes were an improvement in supplies of dried eggs in the United Kingdom (which offset a continued decline in shell eggs), an increase in supplies of fresh fruits and vegetables in the United States and Canada, and a temporary increase in the United Kingdom of supplies of citrus fruit. Butter, sugar, canned milk, and canned fruits are rationed in all three countries. Other commodities rationed in the United States in 1944 were margarine, cheese, the more popular cuts of meat, canned fish, canned tomatoes, catsup and chili sauce, and certain canned juices. Apart from bread, potatoes, vegetables, and fresh fish (which is scarce) almost all foods were still rationed here.

Supplies of food in the United States and Canada, measured in nutritional terms, on a per-capita basis, have increased appreciably since before the war. Calories, fats, animal proteins, and vitamin A are below the pre-war level in the United Kingdom, but other nutrients, including vegetable proteins, are appreciably higher. Food-supplies of all three countries in 1944

In England Now

A Running Commentary by Peripatetic Correspondents

COMING home to London from India it is the quietness of the people, and the general orderliness that strike one most. When two taxis meet in London nobody shouts at anybody. They don't even hoot, whereas in India there are the vocal rows which make up the day's work. Life out there seems full of material for strife, quarrels and arguments reach a very high order, and as a result every journey provides its incidents. When nothing happens the Indian takes a well-earned rest [illegible] lying on the pavement to sleep; obstructing the roadway or footway is nothing to take notice of. Sleeping, squatting, or just parking your vehicle in the fairway seems to be expected, and others going that way make a detour.

No one could regard war-time railway stations as models of peace and decorum, but so they seem after the indescribable babel on an Indian station as a big train comes in. And here the trains hurry off so. There is none of that pleasant sauntering about, and freedom from any anxiety about the train leaving on time. One is still a little surprised at the way English trains rush through quite important stations. There is, too, an astonishing variety in our landscape. In the short suburban run which I now cover daily you can look out at trees, hills, tunnels, a big place, several small places, a gentleman's park, and a housing estate. What a contrast to the miles and miles of undifferentiated plain, with thorns and scrub, waste water, and no drainage, with miserable looking herds in charge of a couple of infants with sticks. How rich and complicated the life that a few hundred acres of the suburbs here conceal! Yet, nowhere in the world is one so conscious of the pressure of teeming life as in the Indian streets. They seem full to overflowing at all times of the day and half the night as well.

Once again one is struck with the success of price control in England. The shops are mostly far better stocked than when I left a year ago, and few essentials seem to be entirely unobtainable now. In Delhi they would cheerfully try and sell you a torch, telling you at the same time that batteries were unobtainable. At one time only the Army could supply electric light bulbs, and dud bulbs were being sold so they could be returned to the Army for exchange. A new bulb cost ten shillings, but the duds cost less. It was difficult to understand why, during the famine in Calcutta, rice was still served in large quantities in hotels, restaurants, and private houses, often to people who would gladly have gone without, if they had been sure that what they spared would go to those in need.

It was difficult to get any sense of concerted and coöperative action over anything out there, and perhaps my most striking impression on coming home was of the highly developed social sense in England. Here people still take a lot of trouble to help others in small ways—the bus conductor when his rush is over will offer to change your pound note; if the carriage is nearly full someone will move up to make room for you—and a group, in the social sense, quickly forms around you and your problem. It is hard to describe the cold and unhelpful indifference with which a problem is met out there. No-one will take charge and assume responsibility for giving directions. And often they escape on a technical fault. You booked a reservation. Yes? You saw the man write it down and he said the seat would be kept. But he has not written it in my book, so how can I help you? There the matter would be left, with the fatalistic acceptance of misfortune which goes deep in the Indian character. But if you persist, the amazing truth dawns on them that you are not going to take it lying down and are out for a win; then they give in with all the charm of the East, and become kindness itself in trying to find you other accommodation. But they always try the other way first. Now I am home again I can no longer drop my soiled clothes on the floor with any hope of their being picked up, except by myself, and the reluctant, once-a-fortnight English laundry does not encourage the pleasant habit of clean clothes daily. The worst thing about changing within a few days from 90° to 40° F is the immense bulk of clothes one has to put on. There is a great deal to be said for white linen and cool silk, sandals and no hat (or their male equivalents), and the informality that goes with them.

Here the war is still imminent and paramount; life is hard, and body and soul have to be kept together, whereas in India they have an engaging way of floating off apart. Unless one has served in the East one cannot appreciate the feeling of isolation which goes with all this. Perhaps that is why, in spite of some amenities which are lacking here, the soldier out East, even in a peace station, feels very hardly done by. He feels all the time a forgotten man; nothing he does has the stamp of reality because it is not shared with those who make up his real roots and attachments. All his acts are a sort of dreary marking time until real life can be resumed, although he may never be actively unhappy. Yes—there is a lot to be said for Britain. With its imperturbable superiority, and its cold and inhospitable bedrooms, it is after all home.

* * *

I was listening to one of the excellent transatlantic broadcasts in the *People to People* series, one night when I heard a description of a tour in a shipyard on the US Atlantic coast, with commentary by various interviewees. I was struck by the reply of one man to the question: "And what is your job?" "I'm a trouble-shifter," he said, and went on to explain his duties. He spends all his time looking for trouble anyplace in the yard, and ironing out the creases.

He performed, it seemed to me, a highly useful service, and was the sort of servant that any busy hospital would be glad to have. I thought of him recently when we were particularly busy in our hospital. The set-up was all too familiar in these days—not enough beds, too many seeking admission, and no place to send some of our occupants. I wished for a trouble-shifting good fairy who would take our chronic sick back to a hospital near their homes, who would wave her wand and transport to a comfortable convalescent home round the corner our skin patients, some of the multi-medical ladies, the chronic arthritis whom nobody wants, and the old lady of 80 with a Pott's, and that other old evacuee of 82 who came to lodge with her daughter's strangulated hernia.

Lately we've been troubled with another type of bed-blocker. He arrived from overseas via a hospital in the north country. He has a walking plaster, or a long and recent scar on the back of his thigh, or a couple of missing terminal phalanges; and his home is round the corner. He is a soldier "who is desirous of being transferred to a hospital near his home and is fit to travel by ordinary public conveyance without an attendant." (Why not "who wants to go to a hospital near his home and is fit to travel alone by train or bus?") He is a man who deserves the best his country can give him, and he requires perhaps ten or twenty minutes' attention daily or weekly. Our nearest convalescent home is 20 miles away, and for him without a motor-car is almost as remote as the north country hospital whence he came. So he must be kept "occupying" a bed, a potential trouble-maker, while the civilian waiting-list grows longer; were he an officer he could live at home and attend for his massage as an outpatient.

The soldier I should like to get to a hospital near his home is Sandy, who has lost a chunk of one thigh and is minus a foot. He is a cheerful soul, but I know he is beginning to long for a sight of his wife, bairns, and old parents over the border. May the good fairy grant his wish!

Stop Press: She is going to!

* * *

Feb. 1—and still keeping a diary. There were no less than 9 blue tits on the lawn before breakfast this morning and when I was watching them from the dining-room window suddenly into the middle hopped a tree sparrow, a bird with which I have since a boy always identified myself: neat, dapper, looks like an ordinary sparrow, but by God what a difference! So I knew I was in for a good day and was not surprised when they all flew away as the postman came up the drive, bringing me a handful of letters, one of which was to say that all my work on the Boot Advisory Board is not to go unrecognised—an XBE. Not bad, tho' I had hoped for a ZBE. Still—very gratifying! Didn't tell the wife till I was putting on my coat—she was deep in a letter from Mike in Fiji, which I hadn't time to read. Went up to town with old Saunders who altho' he's my own age looks double. Must have cancer or something, which would mean that his nice little property comes into the market. Put him wise about the coming changes in the Ministry. At the office ticked off two clerks, one of them a bit saucy. One can't sack them now, but when the boys come home I'll be patriotic all right! Had a row with old Danvers on the Uppers subcommittee. Silly old fool, getting senile. However, everybody agreed with me, which made him look rather silly and sick. Don't think he'll last long. At lunch with the usual crowd; put them right about the coming changes. I think they saw I knew something, but didn't say a word about the XBE. When I got home it had sunk in—Molly and the girls very set up! Mike's letter says he's homesick. If only I'd had his opportunity of seeing the world at his age. He enclosed a postcard photograph taken by a hiding missionary about 80 years ago of cannibals dragging body along for a feast. Supposed to be the only time cannibalism and photography have overlapped. He says on the back: "Friends of yours"? Can't think what he means.

Parliament

FROM THE PRESS GALLERY

IN the House of Lords, on Jan. 23, the Earl of LISTOWEL moved the second reading of the Nurses Bill, the object of which, he explained, was to correct a drafting error in the Nurses Act and the Nurses (Scotland) Act of 1943. To protect private patients or hospital authorities from unfair treatment by nursing agencies—such as a demand for excessive fees or the ministrations of an unqualified nurse—these Acts laid down certain conditions to which those who ran these agencies or nurses' cooperations would be obliged to conform. These regulations included the duty to supply only nurses with accepted professional qualifications, to keep detailed records, and to obtain a licence from the local authority. When part II of this Act was re-examined by the Minister to fix the date on which its provisions were to become operative, it was first noted that the expression "agency for the supply of nurses" was so broad and indefinite that it might be taken to cover such perfectly innocuous organisations as county and district-nursing associations. Not only did these associations, being voluntary bodies, enjoy a reputation unimpaired by the sort of conduct against which the Act was aimed, but some of the smaller associations might even find it impossible to carry on if they were obliged to conform to the regulations. The only way to safeguard these associations, while retaining the necessary measure of control for the nurses cooperations, was to narrow down the meaning of "agency for the supply of nurses." The present Bill would expressly exempt from the regulatory provision of part II of the Nurses Acts district and county nursing associations and other organisations doing similar work in rural areas in England, Wales, and Scotland.

QUESTION TIME

Married Women Doctors in the Civil Service

Captain W. R. S. PRESCOTT asked the Chancellor of the Exchequer whether there was a general ban on the employment in Government departments of married women doctors; and whether, in view of their special qualifications, especially for employment in the Ministry of Health, he would consider action to secure their employment in suitable cases.—Sir J. ANDERSON replied: The normal rule is that married women are ineligible for appointment to established posts in the Civil Service, and that women holding such posts should be required to resign on marriage; but an exception may be made, upon application by the woman concerned, in any case where it is considered that the employment of a married woman is advisable in the light of her special qualifications, or special experience in relation to the duties required of her, or of the special requirements of the department concerned. In view of the power to make exceptions in such cases, no special action seems to be needed in relation to women doctors.—Captain PRESCOTT: In view of the shortage of doctors at the present time, which is likely to continue in the future, and of the special adaptability of women doctors for certain branches of the Service, ought not the general ban to be lifted?—Sir J.

Letters to the Editor

AN ACADEMY OF MEDICINE

SIR,—The interest excited by the recent proposals to bring the Royal Colleges in London together to a common site has revived discussion of the more important matter of the institution of an Academy of Medicine; to this discussion the leading article in your last issue is a contribution of great value. Your insistence that such an Academy should not be under Government control is wise and indeed necessary. It was for this reason that I suggested in the original article (*Lancet*, 1942, ii, 560) from which you briefly quote, that any Government contacts which may be advisable should be at Privy Council level. Whether as affairs have now developed this is desirable or necessary is a matter for discussion. There are advantages in freedom and goodwill, but in no sense should it be a Government Academy. On the contrary, the main function of an Academy of Medicine would be to ensure that the philosophy of medicine remains free, to act as a helpful counterweight to the bureaucratic influence inseparable from any State mechanism, no matter how good its intentions, and to provide the public with an expert and independent opinion on medical matters entirely divorced from politics. Abroad, it should be able to show how great is the ultimate value of international relationships fostered by cultural methods without the taint of economic entanglements or political expediency and be a leading influence in encouraging intellectual contacts and fostering research.

Many changes have occurred since the publication of my original suggestion. The white-paper on the National Health Service has been published and accepted in principle by Parliament, and the several bodies at present dealing with its implementation cannot now be disturbed. The Goodenough report, also accepted by the Government in principle, has provided a mechanism for the invigoration of postgraduate teaching and research with State aid through the universities, and it can reasonably be hoped that this will work well. This leaves the functions of any Academy more simple and more purely "academic" than I had visualised at that time. Two questions therefore present themselves: why have an Academy? and, if it is a good thing, how should it be formed?

It may be said that the Royal Colleges of Physicians, Surgeons, and Obstetricians in London, and the corresponding bodies in Scotland, together with the various faculties and associations formed by the specialties as at present constituted, are suitable to the task of advising the Government in its vast new social responsibilities, guiding a rapidly awakening public opinion, integrating medical thought and progress throughout the Commonwealth and Empire, and mobilising the humanising influence of medicine to aid in restoring the broken culture of Europe. I question it; nor would it seem reasonable that they should be so able if they remain divided without a common endeavour. The reasons for division are specialistic and traditional, both good in themselves but not enough. We in medicine are not really physicians, surgeons, and obstetricians working in separate compartments. As an ophthalmologist I am a part-time physician, part-time surgeon, but whole-time doctor. Nor does the philosophy of medicine differ in London from that in Scotland, or for that matter from [illegible]

And again, the in
medical philosophy
existing among the dozen or more Government departments which administer medicine, many of which look upon it from different viewpoints—whether it be that of
bour, or the several ministries
edicine, or those administering
Wales, the Colonies, or the
for an Academy of Medicine
answers to these questions:

If the practice of medicine becomes more and more an affair of the State, is the profession provided with a body powerful enough to preserve the soul of medicine in its personal and creative aspects without which it cannot live?

Is professional medicine in this country doing all it might to invigorate our national life?

Does it form the natural centre of medical thought throughout the British Commonwealth ?

Is it ready to exert the leading medical influence in post-war Europe that so many peoples there now desire to replace the dominance hitherto exercised by Berlin ?

For all these the potential is here ; but are the means and the direction at hand ?

How an Academy should be constituted is at this stage a matter for discussion. So far as I am concerned (at present) I should like to see the colleges and other similar bodies retain their individuality, maintain their traditions, and exert a still greater influence than hitherto each in its own particular field. But I should like to see them choose their best and give birth to something new, by evolution and not by revolution, so that. working in combination for common ends, British medicine could seize the unique opportunities of a rapidly changing and exciting age. And it should not be the colleges and specialist associations in London alone, but those also in Scotland and, for that matter, in the Commonwealth. Otherwise I see a continuation of the drift of past years—an unorganised profession at home, a looking of the students of the Commonwealth to New York instead of London, and a failure in British medicine to add greatly to the humanity and stability of society.

London, W1. STEWART DUKE-ELDER.

SUDDEN DEATH AFTER INTRAVENOUS NEPTAL

SIR,—We read with interest Dr. Rennie's paper of Jan. 13. There is no doubt that many deaths have been directly attributable to the mercurial diuretics, but clinicians are perhaps reluctant to publish such results. It appears desirable to collect all possible data in these cases, in order to arrive at the exact mode of death. The following case in many ways resembles that described by Rennie.

A boy, aged 14, was admitted to the Royal Northern Infirmary, Inverness, on Sept. 29, 1944, with a history of backache of six weeks' duration and swelling of the face and ankles of more recent origin. On admission the boy was generally œdematous. The heart was slightly enlarged ; BP 130/80 mm. Hg. There was a small quantity of fluid at both bases ; no ascites was present. Fundi and CNS were normal. The urine contained much protein, sometimes over 2%, and some scanty red cells and casts. Biochemical findings were as follows—

Date	Plasma-proteins (g. per 100 ml.)		Blood-urea (mg. per 100 ml.)	Blood-cholesterol (mg. per 100 ml.)
	Alb.	Glob.		
Sept. 30	2·8	2·2	81	432
Oct. 20	..	..	72	..
Oct. 31	3·6	2·4	..	..
Nov. 3	..	..	..	384
Nov. 21	..	..	36	..

On Oct. 1 the patient was put on a diet containing 40 g. of protein daily, with restriction of fluids and salt. By Oct. 15 the œdema, which had diminished slightly, had again increased. It was decided to administer plasma intravenously over a period of 24 hours. At the beginning of the sixth pint, which was reconstituted dried plasma (the previous 5 pints were undried plasma), a rigor occurred and administration was stopped after 5 pints 4 oz. There was no effective reduction of the œdema or proteinuria, so it was then decided to try mercurial diuretics. On Nov. 13, 16, 18, and 24 'Neptal' was given intramuscularly. After one of these injections severe headache was noted ; it was paroxysmal but similar headaches had occurred before neptal was used. The diuresis obtained was fairly satisfactory, so 8 days later (Dec. 2) a further course of neptal was begun ; 2 c.cm. was given intravenously without any untoward effect. On Dec. 5 the intravenous injection was repeated, but this time with a fatal result. Symptoms before death were similar to those described by Rennie ; there was cyanosis and collapse, followed by death within two minutes. At autopsy, apart from the renal lesion, there was nothing to explain the sudden death.

This case is similar to Rennie's in that both had renal œdema with low plasma-proteins and death appears to have been due to sensitivity to mercury. Another feature of our case was the reaction noted after the administration of plasma. These cases clearly indicate that intravenous mercurials should not be used in such types of nephritis. It is only fair to mention that the makers of neptal record that fatalities have occurred, probably of an anaphylactic nature, in cases of nephrosis, and advocate intramuscular injections in patients with such lesions.

Royal Northern Infirmary,
Inverness.

ARCHIBALD DICK.
D. G. LEYS.

HOSPITAL FOOD

SIR,—I should like to add several more reasons to those you have mentioned as common causes of indifferent food service in the average hospital.

At the hospital for which I speak the normal bed occupancy is around 400 and the number of staff who have meals is roughly 200. The food allowances are good, and the catering—though not the buying—is in the hands of a domestic-science-trained team of four : three of them—with manual grade help—are responsible for the cooking only. We are at some disadvantage in the matter of kitchen equipment, and we have insufficient modern food conveyors ; but I am convinced that our greatest disadvantage is in what happens after the food reaches the ward kitchen. Delays of all kinds interfere with the service from that stage—morning dressings and treatment held up for some reason, dressings down for inspection, visiting medical staff doing ward rounds, resident medical staff requiring sisters' assistance to set up drips, transfusions, or other such emergency treatment. As a result the service of the most important meal of the day is of necessity left to the discretion of the nurses in training—few, if any, staff nurses being available to deputise for sisters. Also on account of these untimely medical visits, there is often a demand for bedpans or urinals from patients who had waited for the end of the medical visit before asking for this attention. These demands reduce the number of nurses available to take round the meal. Despite a time-table which allows 45 minutes for its service, dinner is thus late, and the time arrives when half the number of nurses on duty must go for their own meal, causing further protraction.

Visiting and resident medical staff would contribute considerably to the improvement of the situation if they would realise how far-reaching are the results of their calls on the ward sister's help at the time when she should be free to give her personal attention to this most important function.

I entirely agree that it is not a good plan to be taking round bedpans while people are eating, but I can assure you that this is not done from choice by the nursing staff but on account of insistent demands by certain patients.

MATRON.

PSYCHIATRIC CASUALTIES IN MALTA

SIR,—Being a civilian doctor, I am unable to throw light on the incidence of Service psychiatric casualties during the siege of Malta (*Lancet*, Jan. 13) ; but some remarks on the psychological reactions of civilians may be of interest.

I left Malta at the end of 1943 and was on the island throughout the siege period, 18 months of which were spent in the civilian mental hospital. One of the striking features of those eventful years was the extraordinary absence of mental ill health. It is remarkable, too, that during the worst months of the blitz a drop in the admission-rate to the mental hospital was registered. This is significant in view of the fact that, owing to the disruption and destruction of homes, one expected that many patients who were normally looked after by their own relatives would be referred to hospital as their nursing at home became more difficult.

Everyone on the island was aware that the struggle was one for survival and that no quarter would be given us by a determined enemy. Every home, man, woman, and child was in the front line. There was no question of running away in such a small area as Malta (less than 100 sq. miles). At the outbreak of hostilities it was

[illegible]
Edinburgh. [illegible]

PERLÈCHE

SIR,—In THE LANCET of [illegible] there appears an [illegible] by Finnerud on "Perlèche." [illegible] that the word is a [illegible] a variety of conditions [illegible] will be [illegible]. In two [illegible] 1941, [illegible] J. 1941, ii, 110) I [illegible] a plea for [illegible] this word from the [illegible]; I would like to do so again now.

[illegible] makes Lemaistre responsible for the [illegible] of the word perlèche but this is not quite true [illegible] among the [illegible] It is [illegible] to indicate a specific lesion, with a specific cause. I submit that if used at all in this country, it should be reserved for the [illegible] condition described by Lemaistre due to a streptococcus. But why use a French word at all when writing in English? We might just as well use the French word "la gale" when we wish to speak of the itch (scabies)! Further, if the condition described by Lemaistre was not due to a streptococcus the greater the reason for suppressing the word perlèche—it may well have been due to a riboflavine deficiency. Surely there can be no excuse for propagating such a hybrid as "pseudoperlèche." So much for the name; now for the condition.

In your annotation you write: "Faced with such a list of conditions mentioned by Finnerud the nutritional expert must obviously exercise caution before he diagnoses riboflavine deficiency on the mouth-angle lesions alone." There is truth in this observation; obviously the nutritional expert, who has spent most of his time in a laboratory, would have difficulty when faced with a case of angular stomatitis. On the other hand, it is my belief that after longer clinical study of these several conditions listed by Finnerud, and their evolution, the confusion which has arisen from want of care in making observations will disappear. The experienced clinical nutritional expert finds less difficulty, I think, than has been suggested, in making a correct diagnosis.

London, W1. HUGH S. STANNUS.

EXAMINATIONS IN INDIA

SIR,—Many letters have appeared in your journal from serving officers decrying the lack of opportunity for taking higher degrees. Many doctors are at present in India and have both time and clinical opportunity for study; I understand that it was for this reason that the Royal College of Physicians held one examination for the membership in India. I have learnt, however, that it is unlikely that another such examination will be held in the near future. It would be a great encouragement to serving officers like myself, who are destined to spend several years in India, to think that this decision might be reconsidered.

CAPTAIN, RAMC.

On Active Service

CASUALTIES

[illegible]

Captain W. R. [illegible], RAMC

WOUNDED

Lieutenant R. C. [illegible], RAMC

AWARDS

CBE (MILITARY DIVISION)

[illegible] David [illegible] Evans, MB, [illegible]

OBE (MILITARY DIVISION)

[illegible]

[illegible]

Surgeon Lieutenant M. J. [illegible]

MC

Captain T. G. [illegible]

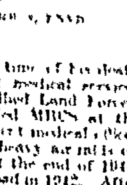
[illegible]

MENTION IN DESPATCHES

Surgeon Lieutenant R. C. P. [illegible], MB, RNVR

MEMOIRS

Major BARNETT [illegible] was at the time of his death on Dec. 2 deputy assistant director of medical services (nutrition) at the headquarters of the Allied Land Forces, South East Asia Command. He qualified MRCS at the Middlesex Hospital in 1939, and was resident medical officer at the Albert Dock Hospital during the heavy air raids on the docks area. He joined the RAMC at the end of 1940, and served in Wales till he was posted abroad in 1942. After a year on the North West Frontier, his special knowledge of nutrition caused him to be appointed as adviser in this specialty, first to Central Command, and latterly to Allied Land Forces. His work to improve the nutrition of British and Indian troops was an important contribution to the war effort and earned for him a considerable local reputation. He travelled continually and he examined some 40,000 men in the course of his surveys. His personality, especially his modesty and sense of humour, endeared him to those with whom he was associated. His death leaves a gap hard to fill and removes a man of great promise.—[illegible]



Captain C. S. R. LOWDON, who was killed in action in Western Europe in November, was the younger son of the late Rev. C. Ross Lowdon of Greenock, and nephew of the Misses Gilchrist of Edinburgh. He was educated at the Royal High School, George Watson's College, and Edinburgh University. Like his brother Andrew, now in charge of the surgical side of a hospital in France, he was a senior president of the Royal Medical Society of Edinburgh. He graduated MB in 1942 and held a house appointment at the Royal Infirmary under Prof. J. R. Learmonth who writes: "Stewart Lowdon first attracted my notice when he was a dresser in my wards by his competent devotion to his work. This quality pervaded his later duties as my house [illegible] realised that he had set himself the [illegible] both of work and of conduct. All his [illegible] well, and with that quiet [illegible] once gained the trust of [illegible] patients. Whatever [illegible] himself in the profession [illegible] his character [illegible]

Obituary

HENRY GAUVAIN

KT, M D. M CHIR. CAMB., M D (HON.) MELB., F R C S

ONLY those who remember the mutilated joints of the past can appreciate the full extent of the revolution in the treatment of bone and joint tuberculosis in the early years of this century. That it all happened so smoothly and with so little acrimony was largely due to Sir Henry Gauvain, one of its leaders in this country. He brought to the work a cheerfulness and good humour which were infectious, and when the revolution was complete and Alton became a place of pilgrimage it was this same happy personality that inspired all who visited the hospital.

Swaine

Born in Alderney in 1878, Henry John Gauvain was the son of Captain William Gauvain. receiver-general for the island. He won a scholarship at St. John's College, Cambridge. took a first-class in the natural sciences tripos, and entered St. Bartholomew's Hospital as senior science scholar. Qualifying in 1906, he became successively house-surgeon. midwifery assistant, and clinical assistant in the orthopædic department. With this somewhat limited experience of surgery he was appointed in 1908 first medical superintendent of the Lord Mayor Treloar Cripples Hospital at Alton. But though he had qualified only recently, he was 30 years of age, and he soon proved himself exactly fitted for the post.

In a paper published in these columns in 1912 he was already taking the modern view he has done much to create. Objecting to the term "surgical tuberculosis," he pointed out that this is a general disease demanding general treatment. "Life in the open air, far from towns, in a dust- and germ-free atmosphere, and under the bactericidal and tonic action of the sun, is a first principle of antibacillary therapeutics." He drew attention to the model provided by Berck-sur-Mer in France—a town that did not attempt to entertain holiday-makers but had as its industry the treatment of the tuberculous. The best results, he thought, would be got by having two conjoined establishments, one in the country and one at the seaside, so that children could be transferred from one to the other. This plan was realised when the Treloar Hospital acquired a seaside branch at Hayling Island. Bathing and exposure on the seashore he found the readiest means of increasing basal metabolism: but those who could not respond must on no account be exposed to such strong stimuli before they had been fortified. The changes in blood and metabolism on exposure of the skin to light and air were further studied at Alton and Hayling Island by Leonard Hill, who recognised the powerful effect of alternation, which makes the English climate so stimulating to those who run about naked on the seashore or live on verandahs. Deliberate heliotherapy was also practised at Alton almost from the first, and in 1914 Gauvain could remark that on any sunny weekday a couple of hundred children could be seen receiving carefully graduated treatment in the sunlight.

It was not surprising that his was also the first country hospital to have a properly equipped light department, and his account of it, given to the electrotherapeutic section of the Royal Society of Medicine, can be read with profit (*Lancet*, 1925, ii, 10). Such was his interest in this subject that he became president of this section, as of the section for the study of disease in children.

Alton led the way, too, by looking after the children's minds. Writing at length with Dr. Evelyn Holmes on the evolution of hospital schools (*Lancet*, 1929, i, 789, 838) he emphasised once more the necessity for combining education with treatment, and pointed out that nearly 1% of children in elementary schools have [illegible] defects needing attention. For the adolescents at Alton he organised the college where the lads are taught a trade.

But Gauvain could not and did not neglect surgery. Three years after going to Alton he was describing in detail in this journal, from an already large experience, the mechanical treatment of spinal caries: and in 1913 he recommended the use of malleable jackets made from 'Celluloid,' rendered non-inflammable by admixture with calcium chloride. A useful sign of pathological activity in tuberculous disease of the hip-joint was noted in 1918 as follows:

> If the femur, on the affected side, be grasped firmly in the region of the condyles it will be found that the head of the bone may be gently rotated within the acetabulum, either inward or outward, through a varying but often considerable angle. When this movement is checked, but the disease remains active, a further slight sharp rotation is instantly followed by spasmodic muscular contraction, not confined to muscles about the joint but extending to the abdomen and visible in the abdominal muscles, or still more easily demonstrated if the palm of the hand is placed on the abdomen between the iliac spines. Quite a gentle and painless but sharp rotary movement is sufficient to provoke this reflex spasm of the abdominal muscles. Naturally, it would not be attempted where the disease is obviously active, but in just those cases where doubt exists I have found it a sign of the utmost value. With a little practice the sign is easily and safely obtained if the disease is active.

Nevertheless, it was as prophet and organiser that he did his greatest work. At Bart's he was known to have enterprise and staying-power, but no-one had quite suspected the vision that turned some hutments of the South African War into five up-to-date surgical units, joined by a terrace which was to become a show-piece for foreign visitors. "The conversion," writes E. C. M., "took the greater part of Gauvain's life and when in the course of it the supply of surgical tubercle began to run short this did not catch him out for there was poliomyelitis and the congenital dystrophies, and the sun-traps and perfect aeration were as suited to the essential needs of any childish ailment. And right in the middle of it all the City fathers who founded the hospital built themselves a little weekend cottage from which in the sundown of their own lives they could find comfort in the happiness they had created, or drive out in the summer to the Hayling annexe and watch the children splashing in the surf on the sand in the warmth of coke braziers, protected from the wind by hurdles. Thus rarely did a master mind work out over long years the vision of his youth."

Perhaps the biggest factor in the success achieved at Alton was the personality of the medical superintendent. He wanted to be friends with everybody, and everybody was delighted to be his friend. He was always cheerful and optimistic, and it was this attitude towards life which he managed to impart to others; so that it was diffused throughout the hospital. The happiness and optimism in the wards and various departments probably did as much as anything towards the cure of the patients. People visiting the hospital for the first time, and expecting to come away depressed, were amazed at the cheerfulness of everybody, particularly the patients, many of whom were lying flat on their back and had been doing so for many months. It is true that Gauvain was nobly seconded by his staff, particularly by two people who worked with him there for very many years; but it was his personality that dominated the place and created the atmosphere.

After the last war Gauvain, who had been knighted in 1920, spent much time in travelling and lecturing, and became indeed an ambassador of British surgery overseas, spreading the new doctrines of conservative treatment and heliotherapy. He could enliven a dull meeting, make a witty after-dinner speech, bring together the discordant elements in a committee and get things done. His persuasive personality was a great help in the period of hospital reconstruction and administration; for example, as chairman of the Joint Tuberculosis Council in its early days, he held together, in a masterly way, the county-council tuberculosis officials and the representatives of voluntary hospitals.

Gauvain's private hospital. the Morland Hall Clinics, gave him many opportunities for exercising his generally, and in the early days of this war Belgian cripples evacuated from a hospital near Ostend have occupied most of the accommodation there, to the great satisfaction of the Belgian authorities. It was at Morland Hall that he was able to experiment with [illegible] for use in all weathers (*Lancet*, 1927, i, 755; 1934, i, 371). An open-air ward was early erected at King George's Sanatorium for Sailors at Bramshott, to which he was consulting surgeon, and proved its worth; and in the annual oration to the Medical Society of London in 1935 he was able to say of Alton:

> The hospital [illegible] described as a model [illegible]. It is, I think, in many ways the [illegible] in this country. It is not any one [illegible] the great [illegible] devised and perfected [illegible]. To appreciate that treatment one must have been a patient as well as a doctor. The advantages of getting into the open air away from the town, [illegible] must be expected to be [illegible], and in my experience it is a certain factor, the importance of which is as yet inadequately recognised.

Sir Henry Gauvain took the degree of master of surgery at Cambridge in 1918, and was elected FRCS in 1927. He was hon. consulting surgeon to the King Edward VII Welsh National Memorial and was formerly consulting surgeon for tuberculosis to the county councils of London, Essex, and Hampshire. He married in 1913 Louisa, daughter of William Butler, esq., and their only child (Mrs. H. G. Murray) is resident medical officer at Alton. He owned land in Alderney and was chairman of the Alderney Relief Committee. One of his last appearances in print was a letter to the *Times* on behalf of his distressed fellow-countrymen.

JAMES RICHARD WHITWELL

M.B. EDIN.

Dr. Whitwell, formerly superintendent of St. Audry's Hospital, and for many years hon. librarian of the Royal Medico-Psychological Association, belonged to a family owning land in Yorkshire, where there is a village of Whitwell. The son of a doctor, he was educated at Shrewsbury School and at Edinburgh, graduating with honours in 1887. After further study in Berlin and Vienna he became pathologist at the Wadsley Asylum, Sheffield, and then went to the West Riding Asylum at Menston near Leeds, as pathologist and second assistant medical officer. In 1892 he published the first description of the microscopical changes in the central nervous system in myxoedema. From the junior post at Menston he was, contrary to precedent, appointed superintendent of the Suffolk Mental Hospital at Melton. Conditions here were far from satisfactory; but by gradual removal of most of the former staff he wrought a great change and was able to do valuable pioneer work. Formerly every mental hospital was clearly labelled as such, and a new departure was made when Whitwell, with difficulty, persuaded his committee that their institution should henceforth be known simply as St. Audry's Hospital. The committee knew his value and supported him consistently; but the strain of administration told, and for a time he suffered from insomnia. After six months' holiday abroad he continued his work, but he was glad when the opportunity came to retire. Happily his last years were also fruitful. About 13 years ago he [illegible] the RMPA library which was [illegible] nd he set himself to make it [illegible] eased the number of journals circulated to members; he [illegible] books; and he added by gi [illegible] ancient tomes. He enjoye [illegible] was able himself to publish three books—*Gleanings from Plato* (1935), *Historical Notes on Psychiatry* (1936), and *Syphilis in Earlier Days* (1940). Another work is, we believe, to appear posthumously.

A colleague writes: "Whitwell was a retiring man really. He had his own opinions and he stuck to them. He was erudite, and nothing pleased him more than making translations from the Greek or Latin. He was not an easy man to get on with; he was at times inclined to throw up everything if he did not have his own way, and he always resented authority. But he was straight and honourable. He was fond of good food (but sparing in that), and liked a good wine; he could tell a good [illegible] and in his younger days he was quite a useful [illegible] Officially he was hard and firm, but he had the Yorkshireman's warm heart."

Dr. Whitwell's wise counsel will be missed not [illegible] the RMPA, but by the Mental After-Care Assoc[illegible] and the London committee of the Lebanon Hospit[illegible] Mental Diseases, in both of which he was keenly [illegible]ested. He died in London on Jan. 9.

JAMES REID DICK

M.B. CAMB., F.R.C.S.E.

By the death of Dr. J. Dick Reid, Scarborough lo[illegible] a doctor who had served the town and its hospit[illegible] over thirty years. As a scholar of Downing C[illegible] Cambridge, he took a second in the natural sci[illegible] tripos in 1900 and qualified from the London Ho[illegible] three years later. After holding house-appointments at [illegible] London itself, at the East London Hospital for Chil[illegible] and at Great Ormond Street, he settled in Scarbo[illegible] and his work there was interrupted only by the [illegible] when he served in France and Italy. His friends o[illegible] time still recall "Ill hand" as a glutton for [illegible] Work, indeed, was the main interest of his life. H[illegible] surgeon to the Scarborough Hospital, where "h[illegible] only slaved like a Trojan but did much good th[illegible] unseen and unknown." He was also medical offi[illegible] St. Martin's Home and the Scarborough Convale[illegible] Home for Children. In his practice he gave his u[illegible] both to his patients and his colleagues. Golf, at [illegible] he excelled, was his one hobby, and for many yea[illegible] was a popular captain of the Ganton Golf Club. "[illegible]ty was Dick's long suit," writes one of his part[illegible] "his loyalty was unquestioned but never blind, and [illegible] saw a fault he would try hard to remedy it. He [illegible] fine practical surgeon, and his surgical acumen and [illegible]ment were equally high. He knew his own limita[illegible] and I have often known him refuse to operate wh[illegible] thought a more experienced man would do bette[illegible] conservative in medical politics, he dreaded the pro[illegible] of political interference in medical freedom. He [illegible] decisive mind and a good reason for every ste[illegible] took."

Dr. Dick leaves a widow. His three sons are se[illegible] in the Forces.

THOMAS ROWLAND CHARLES WHIPHA[illegible]

D.M. OXFD, M.R.C.P.

Dr. T. R. C. Whipham, who died at Exete[illegible] Jan. 20, aged 73, was educated at Rugby School [illegible] New College, Oxford. In 1895 he entered St. Geo[illegible] Hospital, where his father was senior physician, [illegible] he qualified in 1897, obtaining his BM in 1898. A[illegible] George's Hospital, Dr. Whipham held the offic[illegible] curator of the museum, and after a period as me[illegible] registrar there he was appointed physician to [illegible] Evelina Hospital for Children, and assistant phys[illegible] and physician in charge of children at the Princ[illegible] Wales Hospital, Tottenham. In 1918 he gave [illegible] hospital and consulting practice in London, and re[illegible] to Devonshire, where his family had had associat[illegible] for several generations. But he still maintained [illegible] interest in medicine, and by request acted as assis[illegible] physician to the Royal Devon and Exeter Hosp[illegible] consulting physician to the Exeter Dispensary an[illegible] the Exeter area of the Ministry of Pensions. [illegible] textbook on *The Medical Diseases of Children* appe[illegible] in 1916, and like all he wrote was notable for its luci[illegible] absence of padding, [illegible] somewhat deliberate [illegible] his opinion, founded [illegible] in the wards and post-mortem room, was consiste[illegible] reliable, and with it went a happy way of impartin[illegible] views to others.

A lover of outdoor life, Dr. Whipham was a [illegible] ; but arthritis gradually cu[illegible] activities, and since the o[illegible] an acute illness had left hi[illegible] confirmed invalid. But his mind remained clear u[illegible] the last, and he had always something of interes[illegible] store, from his wide reading, for those who visited [illegible]

G. L.

CECIL AUGUSTUS JOLL

M S LOND., CH M BRIST., F R C S

Cecil Joll, senior surgeon to the Royal Free Hospital, the Royal Cancer Hospital and the Miller Hospital, Greenwich, who died on Jan. 25 at the age of 59, had been ailing for six months, but he worked on until a fortnight before his death. His mastery of technique, combined with a wide knowledge of surgery, boundless energy, and an ability to express strong views in simple words, have left a deep impression at the many hospitals to which he was attached.

Lafayette

He was born in Bristol, the son of Mr. W. F. Joll, and read for his B Sc at Bristol University, where he won several scholarships and the committee's gold medal, graduating in 1905. At first he read dentistry as well as medicine, and he took his LDS in 1907. He did his preclinical work at University College, London, and spent his clinical years at the London Hospital. In the London MB examination he gained honours in four subjects and the university medal. He took his FRCS in 1910 and after a period of study in Paris became Master of Surgery at both London and Bristol. His interest in thyroid surgery began with his appointment as RMO at the Royal Free Hospital under Sir James Berry. During the last war he was a surgical specialist in the RAMC, and soon afterwards he was elected to the honorary staff of the Royal Free Hospital. There his tall immaculate figure, his correct frock-coat, and the carnation in his button-hole have become a tradition.

"As a colleague of his for twenty years," writes T. J. H., "I never ceased to marvel at the extraordinary amount of work he managed to do—and do well. He was most conscientious in carrying out his hospital duties. He never missed a hospital round or operation. Monday, which was his main operating day, was for years the high light of the Royal Free Hospital week. He seemed absolutely tireless and on one occasion, I believe, his operation list included ten thyroidectomies and a partial gastrectomy. He was also most punctilious in dealing with emergency operations and never failed to give his services any time, night or day. During the war years his hospital work was still further increased and throughout the blitz he slept in hospital every other night and alternate weekends. By hundreds of students, nurses, and patients he was universally beloved. He never failed to carve the Christmas turkey for his surgical wards and even managed to perform this function on his last Christmas day, though his health had by then seriously deteriorated.

"He was always the embodiment of cheerfulness and good fellowship, whether he was operating, attending various committees, or joining in convivial hospital gatherings. He was a lover of detail and disliked slovenliness in anything; hence his fastidiousness in dress."

Unusual dexterity, attention to detail, and choice of the simplest instruments combined to form Joll's superlative surgical technique. He rarely discussed a case at any length, but if questioned he would give a lucid dissertation on the disease and its surgical aspects, couched in the beautiful English of which he was a master. Apart from his contributions to thyroid surgery, which he brought together in his *Diseases of the Thyroid Gland* (1932), he was a general surgeon in the true sense, and it was his abdominal surgery which impressed his colleagues most. As a man he was difficult to understand on first acquaintance. "He had definite likes and dislikes, and could not suffer fools gladly; anything second-rate was anathema to him, and it was difficult to attain to his ideals. Once understood he was the best of friends, willing always to do his best for rich or poor at shortest notice."

Although surgery was his life's work Joll had many other interests—art, literature, music, travel and above all a love of nature. He was a keen and learned ornithologist, and R. H. G. recalls one occasion when he was operating in a theatre which looks out over the countryside. The case was intricate but in the middle of it he paused for a moment, and turning to the houseman asked, "What bird is that singing in the garden, my boy?" He alone of those present had heard the missel-thrush, and he urged his students to train their senses to note the common things in nature if they hoped to become observant clinicians. He loved good living and good fellowship, and as a host made everyone at his table feel an honoured guest.

In 1924 Cecil Joll married Laura Merriall Winsloe, of Frodsham, Cheshire, who died in 1931. He married again in 1936, his second wife being Antonia Ramsden, of London. He had a son by each marriage.

THE LATE SIR THOMAS BARLOW

Miss Harriette Chick, D SC, writes:—During the last war a group at the Lister Institute were engaged in a study of scurvy by experiments with guineapigs which had recently been shown by Holst and Frolich to suffer from a similar disease when fed upon a diet devoid of fresh vegetable matter. This work was undertaken in order to investigate the antiscorbutic value of various foods for application to army diets. At that time, in the early days of experimental work on vitamins, the view was common among clinicians that information regarding deficiency diseases produced in animals could not be applied to human subjects. Sir Thomas Barlow, however, who first described infantile scurvy, reacted otherwise. He made frequent visits to the institute to observe the results of the experiments, and gave great encouragement by his interest and appreciation of their significance.

A year or two later, the acid test was rendered possible when the same group of workers were investigating nutritional diseases in Vienna after the Great War. Under the incredulous eyes of the Austrian physicians the same substances which were found preventive and curative of guineapig scurvy were also found efficacious for treatment of infantile scurvy which was common in the city at that time. The disease was there known as Barlow's disease, pronounced "Barloff," as the delusion prevailed that the discoverer of the disorder was of Russian nationality.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED JAN. 20

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1564; whooping-cough, 1785; diphtheria, 518; paratyphoid, 1; typhoid, 11; measles (excluding rubella), 12,054; pneumonia (primary or influenzal), 1399; puerperal pyrexia, 137; cerebrospinal fever, 77; poliomyelitis, 9; polio-encephalitis, 1; encephalitis lethargica, 0; dysentery, 377; ophthalmia neonatorum, 51. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Jan. 17 was 974. During the previous week the following cases were admitted: scarlet fever, 45; diphtheria, 22; measles, 82; whooping-cough, 22.

Deaths.—In 126 great towns there were no deaths from enteric fever, 1 (0) from scarlet fever, 16 (0) from measles, 12 (1) from whooping-cough, 12 (0) from diphtheria, 50 (4) from diarrhœa and enteritis under two years, and 56 (6) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 3 fatal cases of whooping-cough. There were 5 deaths from diarrhœa at Birmingham, and 4 at Liverpool.

The number of stillbirths notified during the week was 221 (corresponding to a rate of 32 per thousand total births), including 16 in London.

Royal Medical Benevolent Fund.—The committee of management of the fund at its meeting on Jan. 24 expressed great regret at the death of its president, Sir Thomas Barlow. The income from subscriptions had risen steadily and showed an increase of £1752 over last year. The income from dividends had also slightly increased, and during the year £23,916 was received in legacies. The committee was glad to record that the encouraging state of the fund's finances had allowed them to deal more generously with those who applied for assistance.

Burgen, J. S. Campbell, R. J. F. Campbell, A. A. Cohen, D. H. P. Cope, H. J. P. Davies, Margaret E. Davies, Roger De Vere, Denis Dooley, E. J. Dowling, J. M. Drew, M. W. Eddings, K. A. Elliott, Thomas Ellis, Edith M. Evans, T. A. Evershed, R. C. Farrow, Ruth M. Fawcett, N. R. Fenton, W. N. Fitzpatrick, M. W. Fordham, W. P. Foster, A. T. H. Glanvill, F. J. Goodey, M. V. Guilmant, K. J. Gurling, John Harding Cox, Mary L. Hare, J. E. Holgate, J. G. Holmes, E. H. Hopkinson, Dorothy I. Howes, Mary P. Hughes, M. F. Hunt, Flavia Z. L. B. James, R. M. Jenner, Moyra P. C. Johnsen, E. D. Jones, Sydney Jones, I. M. Kahan, A. P. Kalra, W. de M. Kellock, D. R. Laurence, Sidney Levine, D. O. Lloyd, H. R. Lomax, Margaret D. T. Lord, G. E. Luke, R. P. C. MacDonald, Kathleen M. M. McDougall, J. R. Macintyre, C. B. McKerrow, Donald MacKinnon, Nora S. McRaith, H. B. Marsden, J. D. Martin, Seymour Mason, Geoffrey Mizbah, M. G. Moore, A. V. Morse, E. W. Nation, G. F. Newbold, D R. L. Newton, D. P. Nicholson, T. M. Nott-Bower, P. R. Ormrod, G. P. Oxborrow; Geoffrey Pollitt, Jean P. Popple, R. W. Povey, T. H. Powell, I. H. Pratt, J. M. Reed, A. P. Roberts, J. M. Roberts, J. H. Robinson, G. J. Romanes, G. A. Rundle, E. L. N. S. Sack, R. G. H. Salkeld, A. O. Sankey, Herbert Schwarz, M. G. Scott, Elizabeth M. Sefton, James Sharp, A. F. Sheldon, D. W. S. Sheldon, C. B. Sherer, J. P. Shillingford, Solomon Shubsachs, D. B. Spanton, John Stafford, G. W. Storey, H. D. Symon, S. D. Tejani, A. E. Thomas, Betty Thomas, J. L. Thomas, N. A. Thorne, Christopher Todd, George Twynholm-Mason, V. M. N. Usborne, P. H. Vernon, Paul Watson, Percy Weinstein, D. P. Wheatley, P. J. Wilkinson, Olwen D. Williams, D. H. Woodhead, M. F. T. Yealland, and George Yerbury.

Diplomas in public health, psychological medicine, and laryngology and otology were conferred on those named in the report of the Royal College of Surgeons in our issue of Jan. 20 (p. 102). The following diplomas were also conferred jointly with the Royal College of Surgeons:

DCH.—A. D. Barlow, T. E. D. Beavan, Joyce L. Chamberlain, Helen Davidson, Mary D. Dixon, Margaret Edge, Agnes J. M. Gilruth, Muriel C. Goodchild, Jean L. Hallum, Elizabeth Hoffa, R. F. Hollick, G. A. James, P. A. Jennings, L. S. Leveson, R. I. Mackay, H. E. Pollak, Millicent M. Rogerson, Leonard Sagorin, Sheila F. Schofield, D. J. Thomas, C. D. Thornley, P. G. Todd, H. G. Triay, Peggy O. M. Tyson, and David Weiner.

DA.—J. D. Blair, Victoria M. Brown, J. S. Calnan, M. V. H. Denton, Cecile P. Fellows, E. K. Gardner, Marion W. S. Green, J. L. Griffin, Ronald Peters, Edith Rhodes, Martin Rushton, T. A. Turnbull, Douglas Wilson, Edith Winternitz, Violet B. Young, and A. H. Zair.

Royal College of Obstetricians and Gynæcologists

At a meeting of the council held on Jan. 27, with Mr. Eardley Holland, the president, in the chair, the following were elected to the membership:

Amelia E. Burch, J. P. O. Erskine, Eric Garland-Collins, A. B. Hay, Jadwiga Karnicki, Gladys E. Keith, Dorothea M. Kerslake, Sybil G. Mocatta, Dorothy M. Shotton, B. G. G. Spiers, Dorothy J. Thompson.

Association of Municipal Specialists

At the inaugural meeting held on Jan. 19, at County Hall, London, with Dr. H. Joules in the chair, more than 100 attended and the following appointments were made:

Officers—President, Dr. H. Joules; treasurer, Dr. B. Barling; secretary, Mr. G. F. Stebbing.

Council—Dr. C. A. Birch, Mr. T. G. I. James, Dr. J. E. McCartney, Dr. J. N. O'Reilly, Mr. P. V. Reading, Mr. D. W. Stern, Mr. Wentworth Taylor, Mr. Rufus Thomas, Dr. J. Duncan White, Mr. S. W. Wright.

The secretary may be addressed at 12, Manchester Square, London, W1.

Pharmaceutical Society of Great Britain

At 7 PM, on Thursday, Feb. 8, at 17, Bloomsbury Square, London, WC1, Dr. S. A. Sarkisov, professor of neuropathology at the Moscow Institute of the Brain, and representative in Great Britain of the Red Cross and Red Crescent of the USSR, will speak on the health services of the Soviet Union.

Royal Medico-Psychological Association

The next quarterly meeting will be held on Wednesday, Feb. 7, at 10.30 AM at 11, Chandos Street, London, W1. The subject of discussion will be electro-encephalography in relation to psychiatry. Papers will be read by Dr. Denis Hill, Dr. R. Sessions Hodge, and Mr. W. Grey Walter.

Royal Institute of Public Health and Hygiene

During February and March on Wednesdays, at 3.30 PM, the following lectures will be given: Surgeon Rear-Admiral G. Gordon-Taylor, surgery and Russia (Feb. 7); Dr. G. H. Newns, infant mortality (Feb. 14); Dr. I. H. MacLean, whooping-cough immunisation (Feb. 21); Dr. Harold Balme, the place of rehabilitation in hospital service (Feb. 28); Lord Forrester, FHA, industry and its environment—physical and social (March 7); Mr. V. Zachary Cope, surgery in the life of today (March 14); Dr. Janet Aitken, rheumatism in children (March 21); and Mr. Frederick Pratt, obstructive abdominal conditions in infancy (March 28). All the lectures will be held at the institute, 28, Portland Place, London, W1.

Medical Society of the LCC Service

A meeting of this new society will be held at Paddington Hospital, Harrow Road, W2, on Wednesday, Feb. 7, at 2.30 PM, when members of the staff of Paddington and St. Charles Hospitals will demonstrate cases.

Royal Society of Medicine

There will be a general meeting of the society on Tuesday, Feb. 6, at 4.30 PM. At the same hour the section of orthopædics will discuss unilateral osteo-arthritis of the hip-joint. The openers are to be Mr. G. R. Girdlestone, Mr. R. Watson-Jones, Mr. Bryan McFarland, Mr. J. B. Pennybacker, Mr. T. T. Stamm, and Mr. Kenneth Pridie. On Feb. 7, at 2.30 PM, Prof. S. Lyle Cummins will read a paper to the section of history of medicine on Auenbrugger and Laennec. On the same day at 5 PM the sections of surgery and proctology will hold a joint meeting when Mr. Rodney Maingot, Dr. Cuthbert Dukes, and Mr. O. V. Lloyd Davies will open a discussion on carcinoma of the colon. At the section of ophthalmology on Thursday, Feb. 8, at 5 PM, short papers will be read, and afterwards Mr. T. M. Tyrrell will show a film on dacryocystorhinostomy.

Appointments

BLAIR, L. G., MRCS, DMRE: temp. director, radiology department, Brompton Hospital, London.

CRESWELL, H. E., MB CAMB.: examining factory surgeon for Milborne Port, Somerset.

EVANS, G. H., MB CAMB.: examining factory surgeon for Pontypridd, Glam.

LOUDON, P. S., MRCS: temp. asst. surgeon at Kent County Hospital, Sheppey.

MORGAN, T. K., MB LOND.: asst. radiotherapist, Royal South Hants and Southampton Hospital.

YATES, A. G., MD EDIN., FRCP: medical referee for Doncaster, East Retford, Mansfield, and Worksop county-court districts.

The Colonial Service announces the following appointments:

MCSORLEY, J. G. A., MB NUI, MO, Nigeria;
JOHNSTONE, F. J. C., MD EDIN., DPH, DTM, DMS, Gold Coast.
BRANDAY, W. J., MRCS, MPH JOHNS HOPKINS, ADMS (Hospital and Personnel), Jamaica.

Births, Marriages, and Deaths

BIRTHS

ATKINS.—On Jan. 20, the wife of Flight-Lieutenant John B. Atkins, BM—a daughter.

BENNETT.—On Jan. 24, in London, to Dr. Margaret Bennett (*née* Allchin), wife of Mr. H. W. D. Bennett—a son.

BUTCHER.—On Jan. 23, at Bromhead, the wife of Dr. H. G. H. Butcher, Branston Hall Sanatorium, Lincoln—a son.

ELLIS.—On Dec. 30, at Palmers Green, the wife of Lieut. J. Williams Ellis, RAMC—a son.

HAMILTON.—On Jan. 24, at Parkstone, Dorset, the wife of Surgeon Lieut.-Commander S. G. Hamilton, RNVR—a son.

JEFFERISS.—On Jan. 20, in London, the wife of Dr. F. J. G. Jefferiss—a son.

STARKIE.—On Jan. 22, at Northampton, the wife of Dr. E. T. W. Starkie—a daughter.

TURGILL.—On Jan. 22 at Gerrards Cross, the wife of Flight-Lieutenant Leslie Turgill, RAFVR—a daughter.

YOUNG.—On Jan. 23, at Exeter, the wife of Dr. B. A. Young—a son.

MARRIAGES

FIGGIS—HARGREAVES.—On Jan. 27, at Harrow-on-the-Hill Morton Milnes Figgis, c [illegible]

JACKSON—MARTIN.—On Ja [illegible] Arden Jackson, captai [illegible] commander ATS.

PATERSON—DALWICK.—On Jan. 20, at Bournemouth, Harold Rose Paterson, major RAMC, to Alys Emalie Dalwick (*née* Hersey).

WILSON—MACDONALD.—On Jan. 24, in London, Lieut.-Colonel D. A. O. Wilson, RAMC, to Mrs. Macdonald (*née* Goodban), widow of Lieut.-Colonel Angus Macdonald, RAMC.

WOOD—WILLIAMS.—On Jan. 13, at Barwell, James Willoughby Wood, surgeon lieut.-commander RNVR, to Mary Elizabeth Grant Williams, WRNS.

DEATHS

COLLINSON.—On Jan. 25, at Linton, Wetherby, Yorks, Harold Collinson, CB, CMG, DSO, MS LOND., FRCS, aged 68.

COTTERILL.—On Jan. 21, in London, Leonard Cotterill, MB ABERD., lieut.-colonel RAMC, aged 75.

GREEN.—On Jan. 22, Alan Baldrey Green, MA, MD CAMB., of Acton Castle, Perranuthnoe, Corn [illegible] antivariolous vaccine department, [illegible]

HAMILTON.—On Jan. 24, at Cambridge, [illegible] FRCSE, late lieut.-colonel RAMC, T. formerly of Dover.

JOLL.—On Jan. 25, in London, Cecil Augustus Joll, MS, B SC LOND, MD BRIST. FRCS, aged 59.

SMALLEY.—On Jan. 25, at Hove, Sir Herbert Smalley, MD DURH., aged 93.

WEST.—On Jan. 26, at Hoddesdon, Hertfordshire, Leonard West, MB EDIN., JP.

WILKINSON.—On Jan. 21 at Poynton, Cheshire, Arthur Thomas Wilkinson, MD LOND., FRCP, aged 91.

[illegible] *n short supply owing* [illegible] *er should not be taken* [illegible] *available for export.*

INGUINAL HERNIA

THE HOUSE THAT BASSINI BUILT

W. J. M. Brandon, F.R.C.S.
LIEUT.-COLONEL R.A.M.C.

A survey of the published work on inguinal hernia reveals three fundamental facts: that most of it is either repetition or unconscious reiteration; that a good deal of it is dictated by the fashion of the moment; and that at the present rate of progress the course will continue to be [illegible] indefinitely. "These solemn words which seem so novel to those that speak them were said in accents every whit as confident a hundred years before. The pendulum swings backwards and forwards. The circle is ever travelled anew." (W. S. Maugham.)

The current phase in the treatment of inguinal hernia might well be described as the "fashion phase." In other words, simple excision of the sac has become a standard method of repair for the uncomplicated type of oblique hernia, the Bassini has been relegated to the museum, and the reconstruction of the inguinal canal for direct and large oblique hernia has been left to the devices of the "Old Gang"—the Halsted, the Bloodgood, the McArthur, the Gallie, the silk lattice repair, and their innumerable modifications. These methods have failed in the past, and there seems little reason to believe that they will not continue to do so in the future, but this troublesome aspect of the problem is happily surmounted by inferring that the world has been populated by a high proportion of incompetent surgeons.

An assessment of the recurrence rate of inguinal hernia is equally conducive to a migraine. The only point on which there appears to be any unanimity is the interval between operation and recurrence. Most authorities agree that about 70% of recurrences take place during the first 12 months and that 90% have recurred by the end of the second year. For the rest, the figures given for recurrence depend on either personal experiences suggestive of the most incredible good fortune, or on statistical reviews handicapped at the outset by an inadequate knowledge of the severity of the hernia, the type of operation, or the technical ability of the surgeons involved. No estimate of the recurrence rate can have any practical value unless these points have been examined most carefully, and above all the review must embrace individuals exposed to strain such as members of the Armed Forces or of the Metropolitan Police; for repairs which are adequate for sedentary or semi-sedentary occupations will not always withstand the stresses of active service. A true computation of the results of war-time inguinal hernia surgery is not yet available, but A. O. McPherson (see Page 1942) has worked out the following series of recurrences from operations performed on Metropolitan Police personnel at St. Thomas's Hospital.

Operation	*No*	*Recurrences*	*Recurrence-rate %*
1. Excision of sac only	86	8	9·3
2. Fascia lata repair	39	6	15·4
3. Other methods (Bassini, Fowler, McArthur, Bloodgood)	17	3	17·6
Total	142	17	12·0

Though this series is small, the figures indicate the rate [illegible] surg [illegible] strik [illegible] operations. This impression is supported by a wider review.

For practical purposes it can be assumed that simple excision of the sac offers the greatest chance of success provided the cases are suitably chosen, and that nearly all the operations designed for the reconstruction of the inguinal canal succeed or fail with about equal regularity. Various reasons have been advanced for this persistent failure, such as the wrong choice of operation, poor surgical technique, the wrong type of suture material, the age or poor physique of the [illegible], postoperative care, sepsis, [illegible] I do not propose to bore the [illegible] centre of interminable discussion on these [illegible] Instead, I shall employ a simple parable.

The House that Bassini Built.—Once upon a time a man called Bassini built a beautiful house on the side of [illegible] It soon became the envy and admiration of everyone for some reason this house kept falling down and had rebuilt over and over again.

Now Bassini was a very popular man, and he s from no lack of helpful advisers. Some of his [illegible] strengthened the walls for him, some intr new and indestructible materials; some redesign house completely, making its plan so complicated th onlookers were unable to understand it and natural regarded it a great advance; a few rebuilt it from foundations, working on the principle that if a house the hard way it would be harder for it to fall down the rest paid little attention to the designs of the builders, and were thus able to produce new m methods in enormous quantities. But to the amaz of everyone the house continued to fall down, thou [illegible] it stayed up for a while longer.

As time went on a great many people became inte in this house because there were a lot of houses to b and it seemed only right that a house should last the lifetime. But the onlookers were confused b discussions among the builders, and still more by theories that seemed to affect them. Each grou unable to see the ruins of their own house, however it fell down, yet when others failed with the same they decided that the workmanship must have been and offered correspondence courses on how it oug [illegible]

Then a wise man called Ogilvie remembered th great grandfather once built a little shack on the sid hill, because large houses could not be built in those He came to the conclusion that, if a man must live o side of a hill, and can live alone, the lighter he mak house the less likely will it be to fall down or slide int valley. He backed his opinion with such lucid and arguments that it took only ten years for the other b to realise what he was driving at. But when this fa grasped, everyone became happy and there were rejoicings till they remembered that this kind of would not do for a man with a large family. At this it became necessary to add a new wing to the local lib

Now about this time a certain simple fellow, who rebuilt his own house many times with no one to help viewed this strife from afar and then pondered over follows: "Strengthening the walls does not stop a falling down; binding them with indestructible mat does not seem to help; even silver spires do no more improve its appearance; and I cannot see how lo discussions on the merits of the different kinds of m and cement have affected the result. If a house per in falling down in spite of having *immensely* strong w it can only mean that no one has examined the fou tions with sufficient care." So he proceeded to de And the result of his work is recorded in these pages.

Why Inguinal Herniæ Recur

Any attempt at an explanation of recurrences a operative repair must take into account the meth of operation, the types of hernia for which they performed, and the way in which they fail. For sake of simplicity I propose to follow the plan laid d by Ogilvie (1937*a*, *b*, *c*, 1939), dealing as briefly as poss with those aspects of the subject he has covered adequately:

1. The standard operation for congenital hernia with muscles.
2. Modifications of the *standard* operation for acquired old-standing congenital hernia where the internal has become stretched but the muscles are still good.
3. Operations for direct and large oblique hernia.

Group 1. Standard operation for congenital [illegible] with good muscles.—Ogilvie's [illegible] operation but the surest [illegible] recurrence." We find in practice [illegible] this operation gives far and away the lowest rate recurrence. When a recurrence does take place [illegible] sac is an oblique one and has resulted from a technical error on the part of the surgeon. He has either failed to ligate the sac at the neck or has applied the operation to a hernial sac which is more than half an inch in width at the neck, when flattened across the examining finger, thereby leaving a lax internal ring.

Group 2. *Modifications of the standard operation.*—(*a*) *For old-standing congenital hernia*, where the muscles are still good but the margins of the internal ring have been stretched: In this type of hernia removal of the sac with repair of the torn or stretched transversalis fascia again offers the most logical method of treatment. The internal ring has been reconstituted to its normal size and the muscles which are still efficient will now be able to protect it. If a recurrence takes place the sac is an oblique one, and results from the application of this method to hernial sacs which are greater than an inch in width at the neck or from a misjudgment as to the efficiency of the muscles.

(*b*) *Acquired oblique hernia*: Ogilvie has described this type of hernia so clearly that few surgeons should fail to distinguish it from the congenital type. Here the modified type of repair for acquired oblique hernia cannot be applied with the same certainty of success. The hernial sac, we are told, "has its origin in a prolapse of the cord due to the combined influence of poor muscles and repeated straining" (Ogilvie). In other words, the recoil mechanism of the cremaster has become defective. We find at operation on this type of case that the cremaster is invariably thinned out and sometimes almost non-existent. If it is assumed—and there is no evidence to the contrary—that the transversalis fascia was intact originally, how can a patched-up transversalis fascia fare any better? Particularly as the efficiency of the muscular mechanism has in no wise been enhanced by the operation. Whatever the explanation may be for the formation of any acquired hernia, there is a world of difference between a muscular mechanism which cannot cope with a preformed sac and one which cannot prevent the formation of a sac. Therefore all oblique hernial sacs that are relatively short, wide-necked, and thick-walled, and are easily separated from the surrounding structures and lie outside the infundibuliform fascia, should be treated by a reconstruction of the inguinal canal. I have found that this is the type of hernia that lets the side down.

Group 3. *Operations for large oblique and direct hernia.* (*Reconstruction of the inguinal canal.*)—Much of the confusion in the treatment of inguinal hernia has resulted from lumping these two conditions together and treating them as a single complaint. Large oblique and direct inguinal herniæ are two distinct clinical entities and must be treated as such.

(A) LARGE OBLIQUE HERNIA

In this group we are compelled to replace nature's active muscular control of the inguinal canal by a passive channel which must allow unimpeded passage to the spermatic cord but at the same time discourage the insinuating appeal of the hernial sac for an equal right of way. On an average about 15–20% of these cases recur, no matter what method of repair is employed and no matter what degree of approbation any one of them may receive from its author or his supporters. But the fact that about 80% are successful proves that a permanent repair by means of a passive channel is by no means impossible. Edwards (1943) and Capper analysed 131 cases of recurrent hernia in men of military age and concluded that 75% were external oblique (indirect) recurrences, the new sac passing through the internal ring in association with the cord. The remainder were direct, and these were of two types: (*a*) a diffuse bulge, with a saucer-shaped sac (15%), and (*b*) a funicular sac coming through a well-defined opening in the transversalis fascia just lateral to the outer border of the insertion of the conjoined tendon (10%). I am not sure whether this series included recurrences from simple herniotomy and direct herniæ, but I have quoted the figures because they give the proportionate recurrence-rate that I have observed at operation on recurrences from oblique inguinal hernia. In other words, oblique recurrences are far more common than the direct type, or, as Edwards puts it, "the original hernia is reproduced."

Any investigation into the causes of recurrence after reconstruction of the inguinal canal for large oblique hernia should take into account the mechanism by which the recurrence has been produced and the type of sac we should expect in the circumstances. If we compare these findings with the conditions that obtain at operation on recurrent herniæ and find they are identical, we may assume that there is some truth in the hypothesis. For this investigation I propose to use the Bassini repair, first, because it is well-known, and secondly, because it reproduces all three types of recurrences. Since this operation is the prototype of all the posterior repair operations it will serve to show why they too suffer from the same potential weakness at the internal ring, and why, in turn, the anterior repair operations are even more prone to the oblique recurrence.

Direct recurrences.—(i) *The diffuse bulge* is the most popularly accepted type of recurrence and has been handed down from textbook to textbook and from article to article until it has become a tradition. It accounts for about 15% of recurrences, and is due to the cutting-out of the holding sutures and the return of the conjoined tendon to its former position soon after the primary repair. In nearly every case it is the result of excessive and *continuous* tension on the holding sutures, which produces a localised necrosis and an early cutting out of these sutures, before the conjoined tendon has become firmly adherent to the inguinal ligament. There are three well-known causes for this excessive tension—(1) the attempted suture of a [illegible] developed conjoined tendon to [illegible] (2) an inability to distinguish the [illegible] free margin of the conjoined tendon merges into the cremaster, so that a portion of the tendon is brought down which cannot be approximated to Poupart's ligament, except under tension; and (3) simply tying the holding sutures too tightly. If the damage to the conjoined tendon has been excessive, it can no longer close down on Poupart's ligament during active contraction. Thus it can be readily understood that a direct hernia is liable to occur.

(ii) *The funicular sac of Ogilvie* was first described by him in 1937. Capper, according to Edwards, states that it accounts *for about* 0·6% *of primary herniæ.* But when it occurs as a recurrent hernia its incidence is much higher and is due to faulty technique at the primary operation. In the normal way the cord acts as a "cushion" at the base of Hesselbach's triangle, supporting and protecting the transversalis fascia against the outward thrust of intra-abdominal strain. In the case of a healthy well-functioning inguinal muscular mechanism the outward thrust of the intra-abdominal pressure in this area is at right angles to the canal and its contents. Protection is obtained by a tautening of the external oblique aponeurosis and the interposition of the conjoined tendon between this structure and the cord. Therefore any outward thrust against the transversalis fascia is imparted first to the cord in a cross-sectional direction and is then absorbed by the contracted conjoined tendon and the tautened external oblique aponeurosis. The cord, by virtue of its position and bulk, must absorb a certain amount of these counteracting forces, so that it must have as near a "cushioning" action as makes no odds. In the Bassini operation, the cord is separated from the underlying transversalis fascia and placed in front of the conjoined tendon. Therefore, unless the conjoined tendon is sutured down carefully to Poupart's ligament right up to the pubic spine, a small defect remains in the posterior wall [illegible] the outlet of the canal which is often missed because it is hidden by the posterior fibres of the cremaster or by tags of fatty tissue and must be felt for in every case by the examining finger. If this defect is not closed completely a short straight channel is left at the lower end of the canal, covered at its proximal end by unsupported transversalis fascia as it sweeps medially from the posterior surface of the sutured portion of the conjoined tendon to pass behind the deeper lying insertion of the conjoined tendon into the pectineal line (fig. 1). The transversalis fascia in this region is relatively thin, and any intra-abdominal straining may rupture it, allowing the passage of a small funicular sac down the channel to emerge with the cord at the external ring (fig. 2). It will follow that failure to close the posterior wall right down to the pubic spine, in any of

of a man whose feet and left arm are lashed securely but whose right arm is loosely tied. Few would show surprise at his eventual escape, yet this is the principle adopted for the treatment of large oblique hernia.

(b) *Anterior repair operations:* If the above hypothesis is correct, it will be seen that the anterior repair operations, such as the Halsted, Fergusson, and allied methods, are even more prone to this oblique type of recurrence. This potential weakness at the internal ring is much more evident; the new hernial sac is permitted to extend down almost as far as the external ring before it meets its first obstruction. Thereafter it has a short, almost straight, tunnel to negotiate, which must be just pie to this Houdini-like structure now in the pink of condition.

(B) DIRECT HERNIA

The direct hernia presents an entirely different problem. Here we are fighting a losing battle against progressive atrophy of both the muscles and the fascial layers in the region of the inguinal canal. The structures gradually stretch as the result of repeated strain, and a diffuse saucer-shaped sac appears in the inguinal region. If a recurrence takes place, it is again a diffuse bulge of the direct hernia type and means that the primary repair has been unable to withstand this inexorable process of disintegration.

The Remedy

It will be seen from the foregoing that the standard plan for the treatment of inguinal hernia will require some modification. I propose the following amendment—

1. The standard operation for small congenital hernia with good muscles.
2. The modified operation for old-standing congenital hernia, where the internal ring has become stretched but the muscles are still good.
3. Operation for the construction of a new internal ring for acquired and large oblique herniæ.
4. Operations for direct inguinal herniæ.

The standard operation and its modification are so well known that no further description of these operations is necessary. The value of this contribution to the treatment of inguinal hernia has been fully established.

OPERATIONS FOR ACQUIRED AND LARGE OBLIQUE HERNIÆ

The history of large oblique inguinal hernia shows that much time and endeavour have been expended on elaborate repairs to the posterior wall of the canal, which as often as not would have responded to a simpler one, and on wearisome efforts to patch a worn and incompetent internal ring which experience has proved to be a thankless task. The solution seems to be to simplify the repair of the posterior wall, and to scrap the stretched and weakened internal ring entirely, and construct a new one—a procedure which removes once and for all this most frequent source of recurrence. There are two ways in which this may be accomplished:

(a) *Schmieden's operation.*—"After isolation and ligature of the sac in the usual manner, he pulls upon the cord and dissects the testis entirely free from the scrotum. The internal oblique and transversalis muscles are then split in the line of their fibres by blunt dissection about one inch above the internal ring. The testis is drawn through the aperture, which is then narrowed by one or two catgut stitches to the exact size of the cord. The inguinal canal is completely obliterated by suture of the conjoined muscles to Poupart's ligament throughout their length (see fig. 6). The testis is replaced in the scrotum and the external oblique repaired over the cord.

"It has two apparent advantages: first, that the cord, instead of passing from the inner margin of the stretched ring through muscles already weakened, but brought together by suture, now runs outwards from the peripheral part of the ring through a fresh incision in healthy muscles; and second, that the new inguinal canal is longer and more oblique than the one it replaces. In criticism it must be pointed out that the inherent defects of the Bassini still apply to the closure of an empty canal, and that complete dislocation of the testicle may bring in its train sequelæ such as atrophy and hydrocele" (Ogilvie). I must confess that the inherent defects of the Bassini have not deterred me from undertaking this operation, but I do draw the line at the trauma involved in dislocating the testicle from the scrotum.

(b) *An alternative method.*—The following method of constructing a new internal ring is quite as efficient as Schmieden's, considerably less traumatic and much easier to perform. The idea was obtained originally from Ogilvie's account of his silk-lattice repair, in which he incises the internal oblique near its origin from Poupart's ligament in order to get the cord mobilised in a lateral direction for the repair of a weak posterior wall. In the description that follows I have split the operation into two phases in the hope that the principles involved may be made more clear.

Phase 1.—The steps of the standard operation are followed up to the point where the cremaster has been incised and the contents of the cord exposed. The internal oblique and transversalis muscles are now divided close to their origins from Poupart's ligament in the line of the inguinal canal for a distance of 1 to 1¼ in. The sac is then isolated, ligated at its neck, and excised. Two small retractors are inserted and the cut ends of the muscles gently separated. This gives an unimpeded view of the stretched internal ring and allows a comparatively easy closure of the torn or stretched transversalis fascia. Once this has been accomplished, the cord is brought well up into the V of the incision and held with slight tension while the two arms of the V are resutured by two or three interrupted catgut or silk sutures, thus reconstituting the cut muscles around the cord, which now emerges through a well-fitting aperture placed well out in a lateral position (figs. 7, 8, and 9). The construction of this new internal ring may be modified as is shown in figs. 10 and 11. The conjoined tendon is then sutured to Poupart's ligament by a series of interrupted catgut or silk sutures, thus closing the old internal ring and the entire inguinal canal. The external oblique is repaired over the cord and the skin incision closed in the usual manner.

The operation in this form is a modified Bassini with the following advantages: (1) the cord now emerges through a newly constructed and well-fitting muscular internal ring placed well away from the "danger area"; (2) the new canal is longer and more oblique than the one it replaces; and (3) the repaired outlet for the cord through the transversalis fascia now abuts directly against the newly constructed muscular ring, allowing no leeway for the formation of a new sac. Its apparent disadvantages are incisional trauma to the internal oblique and transversalis muscles, and the alleged defects of the Bassini operation.

These two apparent disadvantages must be considered before proceeding to phase 2 of the operation. All experienced surgeons are aware that clean incision of the muscles of the abdominal wall with immediate resuture of the cut ends rarely produces any permanent weakness, except in cases of excessive and protracted sepsis, so we shall pass on to the defects of the Bassini repair. I have attempted to show elsewhere that the main disadvantage of the Bassini is its inability to protect the internal ring against the formation of a new oblique sac. However, the operation has been condemned on the grounds that the conjoined tendon is pulled down and distorted, thereby having to function at a disadvantage; and that the muscle fibres of conjoined tendon cannot be expected to form a firm and permanent union with the fascia of Poupart's ligament. But if it is an accepted fact that the conjoined tendon shuts down on Poupart's ligament, "like the upper eyelid on the lower," in active contraction, there can be no distortion during the active phase. Secondly, the tension on the holding sutures must be relaxed, if anything, during the process of straining, because the conjoined muscles have been sutured in the position they would take up normally when in active contraction, and should only be present during relaxation—i.e., when the conjoined tendon attempts to regain its arched formation in the resting phase. Therefore the tearing away of the conjoined tendon pictured so vividly in the mind's eye of the anti-Bassiniites during active movement and postoperative coughing is a slight misconception. It can only occur as the result of localised

[illegible]

[illegible]

OPERATIONS FOR DIRECT INGUINAL HERNIA

The repair of a direct hernia has as its primary aim the construction of a strong posterior wall, which will not weaken by stretching. As I have mentioned before, a direct hernia results from a progressive atrophy of both the muscles and the layers of fascia in the region of the inguinal canal, so any attempted reinforcement by local fascial flaps is doomed to failure. Even the [illegible] repair is not proof against prolonged and continuous strain. It is here that the silk lattice repair of the Ogilvie type fulfils its most useful function.

Postoperative Care

No article on inguinal hernia can be considered complete without some reference to aftercare. There is little doubt that the 3 weeks' postoperative recumbency is essential, and that light duty after 8–10 weeks, followed by a return to full duty at the end of the fourth month is a fairly safe procedure; but at the expense of being considered old fashioned I maintain that the fate of a hernia is sealed on the operating-table.

Conclusion

The primary aim of this article is to show how acquired and large oblique hernia, which account for a relatively high proportion of recurrences, may be adequately treated without recourse to operations that require the introduction of large quantities of unabsorbable suture material or secondary operations on the thigh. The avoidance of the use of unabsorbable suture material is a point of some importance, particularly when dealing with Army personnel in tropical or semi-tropical countries; while accessory scars on the thigh are often used as a convenient "line of evacuation" to a lower medical category.

I wish to express my gratitude to Major-General W. H. Ogilvie for the interest he has taken in my technical views; to Brigadier A. E. Porritt for permission to publish this article.

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THE NATION'S HEALTH.—Under this title the British Institute of Public Opinion has issued in pamphlet form the three surveys on the Government plans for a National Health Service which they conducted last year among doctors, medical students, and the public (*Lancet*, 1944, ii, 213, 222, 258). A few copies are obtainable from the institute, Aldwych House, Aldwych, London, WC2.

TREATMENT OF THYROTOXICOSIS WITH THIOURACIL

[illegible]

[illegible]

Thiouracil has now been used in the treatment of thyrotoxicosis in this clinic for over a year. More than 60 cases have received the drug, of which 36 have had systematic records of progress made; 25 of these have been observed for 6 months or more. The 36 cases comprise 28 of primary hyperthyroidism, 4 of toxic adenoma, and 4 of recurrent thyrotoxicosis after thyroidectomy. Five were males, 31 were females. Four had [illegible] of diabetes mellitus; 2 were pregnant during part of their treatment. The age at onset of the disease varied from 10 to 64 years, with a mean of [illegible].

The patients were at first seen at intervals of 1–3 weeks, but as they improved at intervals of [illegible] months. At each visit pulse rate, blood pressure, body-weight, basal metabolic rate (BMR), and fasting white blood-cell count were determined. An attempt was also made to obtain an objective record of the size of the thyroid gland by the crude method of measuring the circumference of the neck.

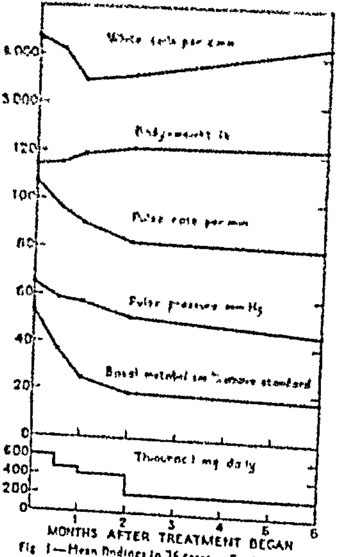

FIG. 1—Mean findings in 36 cases. Findings at 6 months refer to 25 cases only.

The general effects of treatment of the whole group are seen in fig. 1, in which are plotted the means of the results of the observations made nearest to 2 weeks, 1, 2, and 6 months after commencing treatment. The figures for 6 months are the means of 25 cases only. The only case which failed to respond to thiouracil was a diabetic described more fully below. Another patient with thyrotoxicosis recurring after removal of a [illegible]

[illegible] after the [illegible] for resp[illegible] patient [illegible]

[illegible] as to subjective [illegible] not usually appreci[illegible] few cases it diminished. In some cases the gland enlarged during treatment; in others it shrank. The mean circumference of the neck before treatment was 32·1 cm. and after treatment 32·9 cm. This small increase is not significant, especially in view of the increase in body-weight. No definite difference in response was seen between those under and over 35 years, though there was a slightly more rapid effect on the BMR in the older group. The small number of males responded quite as well as the females. The 4 cases of toxic adenoma have all responded to the drug, though in varying degree; one patient with BMR 71% above standard had this reduced to 18% below standard by treatment for 3½ months and has remained well. On the other hand, in a patient with toxic adenoma the

BMR was originally 38% above standard and is still 16% above standard despite 7 months' treatment, and, though she feels well, she still requires 400 mg. thiouracil daily. The cases of thyrotoxicosis recurring after operation responded well though rather slowly; one is developing pressure symptoms with an enlarging thyroid gland for which surgical treatment may be required.

THYROTOXICOSIS WITH DIABETES

Four cases were diabetic. In 3 the diabetes was primary and these all responded well to thiouracil. One of them developed a gastro-intestinal upset with nausea, vomiting, and severe ketosis 3 weeks after commencing thiouracil, but the drug was not thought to be responsible for this incident as he recovered very rapidly when given extra insulin, intravenous glucose-saline, and suitable diet, thiouracil being continued meanwhile. The diabetic in whom thyrotoxicosis was the primary disease is the only patient in my series who has failed to respond to thiouracil.

CASE 1.—Married woman, aged 35, admitted to hospital in June, 1944, for thyroidectomy. She had had an enlarged thyroid gland for 15 years, but at the age of 33 palpitation, loss of weight, and exophthalmos commenced. The thyroid was slightly enlarged, uniform, and firm; pulse-rate 112 per min., blood-pressure 130/75 mm. Hg; BMR 88% above standard, glycosuria profuse, blood-sugar 244 mg. per 100 ml. On being questioned she admitted having had thirst, polyuria, and puritus for 2 months. The diabetes was treated by diet and insulin, which had to be increased to 92 units daily before glycosuria was controlled. Lugol's iodine 2·7 ml. daily was given for 11 days, when it was decided she should not be treated surgically and iodine was replaced by 600 mg. thiouracil daily. The patient was allowed home on Aug. 2, 1944, to attend as an outpatient; pulse 112 per min., BMR 59% above standard. The course of treatment is shown in fig. 2.

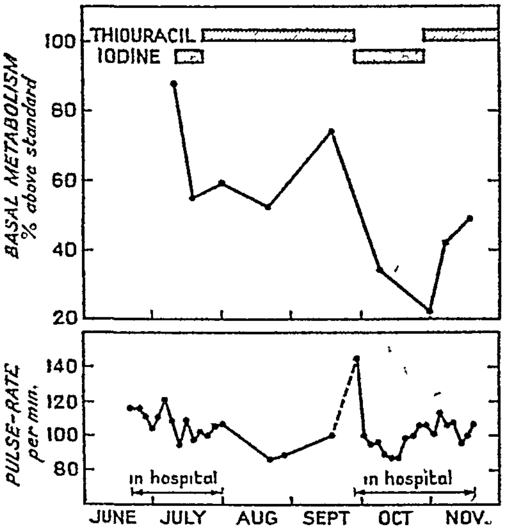

Fig. 2—Findings in case 1, a diabetic.

On Sept. 26 she took a pain in her chest, and, being disinclined for food, she stopped her insulin and became rapidly ill. She was admitted to hospital on Sept. 28 in coma. Despite vigorous treatment with insulin and intravenous glucose-saline the diabetes was not controlled for 36 hours, by which time her pulse was very rapid and feeble and she seemed to be in thyroid crisis. Lugol's iodine was therefore given. Within 24 hours there was a striking fall in pulse-rate and shortly thereafter there was profuse diuresis (see table). General improvement with a fall in BMR was maintained, but her spleen was found to be enlarged and she had hypochromic anæmia with anisocytosis (hæmoglobin 7·1 g. per 100 ml.; red cells 3,470,000 per c.mm.).

After 4 weeks on iodine the pulse-rate again tended to rise and iodine was replaced by thiouracil 800 mg. daily. By this time the spleen was no longer palpable. Following the change to thiouracil the thyroid gland rapidly diminished in size, but the BMR has risen again.

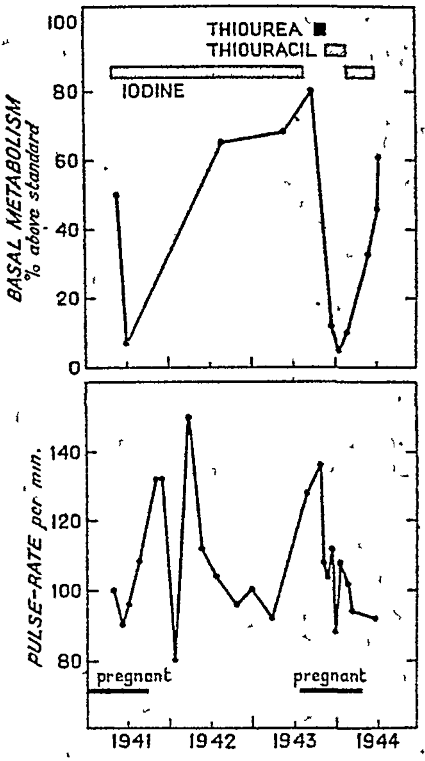

Fig. 3—Findings in case 2, complicated by pregnancy.

THYROTOXICOSIS IN PREGNANCY

Two cases have been treated; their histories are as follows.

CASE 2.—Primipara, aged 28. Seen on account of glycosuria on April 28, 1941, which proved to be due to low renal threshold. She was then 4 months' pregnant. She had exophthalmos, flushed skin, pulse-rate of 100 per min., slightly enlarged thyroid, BMR 50% above standard. She was treated with iodine with the results shown in fig. 3. Her clinical condition improved markedly at first but towards the end of pregnancy the thyrotoxicosis became worse. A stillborn child was delivered without difficulty at term. Despite continuation of iodine treatment her condition deteriorated but she refused operation or any hospital treatment. By August, 1943, her heart was grossly enlarged and she was extremely ill. She was found to be pregnant again and a fatal termination seemed likely. Iodine was stopped in mid-August, 1943, and thiourea commenced on Oct. 20. The fall in BMR and pulse-rate shown in fig. 3 was accompanied by a well-marked clinical improvement. Thiourea was replaced by thiouracil when it became available and good progress was maintained, the heart diminishing considerably in size. Four weeks before confinement thiouracil was stopped and iodine given. She was delivered of a healthy child on April 21, 1944, without difficulty and made a rapid convalescence. Thiourea and thiouracil probably saved this patient's life.

CASE 3.—Married woman, aged 37; two previous pregnancies. She had had thyroidectomy for thyrotoxicosis in May, 1943. On Oct. 19, 1943, BMR was 60% above standard, pulse 100 per min. She was treated with 600 mg. thiouracil daily and BMR had fallen to 14% above standard by Nov. 27, 1943. Thiouracil was stopped on Dec. 10, 1943, as thyrotoxicosis was negligible. The patient did not menstruate

FINDINGS IN CASE 1

	September			October				
	28	29	30	1	2	3	4	5
Pulse-rate (per min.)	AM PM 136 140	AM PM 152 166	AM PM 172 96	AM PM 108 96	AM PM 104 108	AM PM 88 96	AM PM 92 88	AM PM 96 96
Glycosuria	+++ +++	+++ ±	+++ ++	++ +++	+++ +++	++ +++	++ +++	+++ +++
Ketonuria	+++ ++	++ –	± ±	– –	– –	– –	– –	– –
Insulin (units) ..	290	260	50	40	40	40	44	44
Carbohydrate (g. daily) ..	220	250	150	140	140	140	140	140
Urine vol. (ml.) ..	860	1040	1650	1870	1700	5820	6740	2940
Lugol's iodine (ml.)	nil	5·3	2·7	1·8	1·8	1 8	1 8	2·7

after November, 1943. Following cessation of thiouracil the BMR rose again to +17, [illegible] Jan. 17, 1944; iodine, [illegible] daily was again prescribed from this date until April 10 when BMR was +3%, since [illegible], then 400 mg. daily until May 22 (BMR [illegible]), since when thiouracil [illegible] mg. daily till, on Aug. 24, the patient was delivered by caesarean section, [illegible] placenta praevia. The child, a female, had an enlarged thyroid gland but was normal in all other respects. The enlargement of the gland was readily visible in the neck; it was soft and offered no apparent resistance to respiration. The child fed well and progressed normally apart from [illegible] a few days after birth. At the age of 3 months the gland [illegible] apparent [illegible] has been [illegible].

In neither of these patients was there any sign of toxaemia from thiouracil; the drug controlled hyperthyroidism well during pregnancy.

TOXIC EFFECTS

No appreciable toxic effects have been seen in any of these patients. In the 2 for whom thiouracil was used [illegible] mild [illegible]. There does appear to be a tendency for the white-cell count to fall after giving the drug (fig. 1), but this is usually followed by a rise even though the dosage is not reduced. It has been the practice during the past six months to have a differential count made when the white-cell count fell below 5000 per c.mm. One patient developed granulocytopenia while taking 200 mg. thiouracil daily (white cells 3150 per c.mm.; 1150 granulocytes per c.mm.); there were no clinical signs of agranulocytosis; thiouracil was stopped and 2 weeks later the white cells numbered 4600 per c.mm. The splenic enlargement in case 1 may have been the result of thiouracil, but she had had diabetic coma and hypochromic anaemia which complicated the picture. No other toxic effects have been seen.

DISCUSSION

Thiouracil has proved very effective in the treatment of thyrotoxicosis whether of the primary type, from toxic adenoma, or recurring after thyroidectomy. The small number of cases of toxic adenoma treated have, on the whole, been rather slower in response than the primary cases. This agrees with the experience of Astwood (1944), but McGavack and his colleagues (1944) found that toxic adenomas responded as quickly as primary cases. The presence of other endocrine diseases is no contra-indication to the use of thiouracil. I have found it effective in 3 out of 4 diabetics. Nine diabetics have been successfully treated by other workers (Astwood 1943 and 1944, McGavack et al. 1944, Kahn and Stock 1944, Rose and McConnell (1944). Bartels (1944) successfully treated a case of thyrotoxicosis in acromegaly, but Astwood (1944) found a relatively poor response in 2 acro[illegible]

tre[illegible] The latter successfully

[illegible] Addison's disease.

[illegible] from the 2 cases treated during pregnancy, this is no contra-indication to the use of thiouracil so far as the mother is concerned, but the possibility of producing an enlarged thyroid gland in the foetus suggests that thiouracil should be replaced by iodine some weeks before delivery. Whether this enlargement of the foetal

[illegible]

hypertrophy of foetal thyroid, is uncertain; in the former case signs of myxoedema might be expected in the latter signs [illegible] se 3 the child had no clinic[illegible] art from the large thyroid. [illegible] Rose and McConnell (1944), and Williams and Bissell (1943) have treated pregnant [illegible]

It co[illegible]

McC[illegible]

week[illegible]

The[illegible]

chil[illegible]

nant [illegible] with thiouracil showed that the young had hyperplastic thyroids and that they failed to grow for some time after birth. This suggests that the young were hypothyroidic and that thiouracil is transmitted by the placenta.

Four patients previously treated with iodine failed to respond to thiouracil for several weeks after commencing treatment. In case 2 the patient had also received iodine but an interval of over 2 months elapsed between stopping iodine and commencing thiouracil and her response was immediate. Astwood and others (1943) noted that iodine delayed the effect of sulphaguanidine on the thyroid in rats, and Astwood (1944) observed that iodine had a similar effect with regard to thiouracil in man. On the other hand, Astwood found that, even after giving thiouracil, iodine would reduce the basal metabolism and the size of the thyroid gland. This is borne out by the results in case 1 (fig. 2), where the extraordinarily rapid effect of iodine is noteworthy. This suggests that where a very rapid effect is required in thyrotoxicosis iodine is preferable to thiouracil, but against the use of iodine is the fact that it will delay the effect of thiouracil given subsequently. Case 1 appeared to be refractory to thiouracil but responsive to iodine.

Most of the patients were allowed to continue their ordinary work as soon as the pulse-rate and BMR approached normal. In a few cases they continued work throughout though usually against advice. From the experimental work of Baumann, Metzger, and Marine (1944) thiourea prevents the thyroid gland from forming thyroglobulin, and the work of Astwood and others (1943) has shown that the changes in the thyroid after giving sulphaguanidine are due to increased pituitary stimulation resulting from diminished thyroglobulin formation. If, as seems likely, primary thyrotoxicosis is the result of overstimulation of the pituitary gland by higher centres, thiouracil treatment, like surgical, is really palliative and does not remove the cause of the disease. Proper treatment should also aim at minimising the toxic stimulus. I therefore consider it wise to prescribe adequate rest for these patients even though thiouracil may control the toxic symptoms without rest. Whether rest will result in the disease being more readily controlled by thiouracil can only be decided after a long clinical trial. Nevertheless I have seen no ill effects from allowing patients to continue work while under treatment, apart of course from those with appreciable cardiac damage or other complications.

It will be some time before it is possible to assess the relative merits of thiouracil versus surgical treatment. The provisional view put forward now is that thiouracil should be tried first in most cases. Surgery in skilled hands is still probably the quickest way to ensure recovery from thyrotoxicosis, and where time is an important factor it may be the method of choice. Patients suffering from pressure symptoms may require surgical treatment on account of the tendency of thiouracil in some cases to cause enlargement of the gland; it does not at present seem possible to predict whether the gland will enlarge or shrink on treatment with thiouracil. Surgery may offer a better æsthetic result in patients with pronounced enlargement of the thyroid gland.

The dosage of thiouracil found most suitable is essentially the same as that used by others who have treated considerable numbers of patients (Astwood 1944, McGavack et al. 1944, Williams and Clute 1944). It has never been necessary to give more than 800 mg. daily, and the initial dose has usually been 600 mg. daily. The maintenance dose has usually been 200 mg. daily or less, though some patients have required as much as 400 mg. daily. From published work it seems that toxic effects from thiouracil have often been due to over-dosage, but Astwood (1944) records a case of leucopenia in a patient who had received 600 mg. daily in combination with a sulphonamide drug; McGavack and others (1944) had a case of agranulocytosis after 600 mg. daily; Sloan and Shorr (1944) noted jaundice after 800 mg. daily; Kahn and Stock (1944) had a fatal case of agranulocytosis after 800 mg. daily. Provided the dose is small, however, the danger of toxic effects does not appear unduly great.

It has been possible to stop all treatment in 4 of my cases for 8 months and in 3 others for 3½ months without recurrence of thyrotoxicosis, the average duration of treatment in these cases being 4 months. They included all degrees of severity and age, and one case of toxic adenoma. Other cases have however had to continue to take the drug for a year. Even [illegible]

SUMMARY

Thirty-six cases of thyrotoxicosis were treated with thiouracil, including 4 with toxic adenoma, 4 recurring after thyroidectomy, 4 diabetics, and 2 during pregnancy. Pulse-rate, blood-pressure, body-weight, basal metabolism, and white blood-cell count were regularly observed. All but one (a diabetic) responded well. The effects were similar in males and females and at all ages.

The maximum dose required was 800 mg. daily, with 200 mg. as a maintenance dose. Seven cases have remained well after treatment though the drug has not been given for periods of 3½ to 8 months.

Thiouracil was beneficial in thyrotoxicosis during pregnancy and did not affect the pregnancy except that in one patient receiving the drug until confinement the child had an enlarged thyroid gland.

No toxic effects have been seen, though one patient had transient granulocytopenia.

Most of these patients were under the care of Dr. Alex. Glen, physician to the Victoria Infirmary, and I am indebted to him for permission to treat them and to publish the results. I am also grateful to Dr. Stanley Graham, physician i/c sick nursery, Glasgow Royal Maternity Hospital, for allowing me to publish data relating to the infant of one of the patients, and to the staff of the pathology department of the Victoria Infirmary for making hæmatological examination.

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SHOVELLERS' FRACTURE

J. H. Annan, MB EDIN.

CAPTAIN RAMC

From a Prisoners-of-War Hospital in Germany

McKellar Hall (1940) has described 15 cases of fracture of the spinous processes of the cervical or dorsal vertebræ as clay-shoveller's fracture, and Watson-Jones (1941) remarks on its rarity in Britain. So long ago as during the building of the Kiel Canal, German surgeons were conversant with this occupational injury, which they termed *schipper Krankheit*. Here are described 8 cases of this fracture-displacement of part of the spinous process of one or more of the 6th or 7th cervical or 1st dorsal vertebra. Clay is not necessarily involved in their causation.

CASE-HISTORIES

Case 1.—Age 23. Shoemaker before war. Had been doing heavy work for 6 weeks before accident. No general illness around that time. On Oct. 20, 1941, shovelling ordinary spadeful of sand, lifting with shoulders braced when half upright; felt severe pain between shoulder-blades and had to be helped upright. Felt and heard a snap between his shoulders. Painful, but he was able to work again in 3 days' time with only slight pain. A week later had a similar attack—felt it go again! More painful this time and had 5 days off. Back to work but pain in shoulders made him give up. X ray showed fracture and downward displacement of spinous process of 7th cervical vertebra.

Progress: On Dec. 14 went back to work and complained of no pain. One could feel a slightly mobile depressed 7th cervical spinous process.

Remarks: The accident was the first complaint. Position stooping. Felt the snap when taking weight on left arm; probably re-displacement laterally of the fractured process.

Case 2.—Age 28. Brewer's labourer before war. Heavy work for 8 weeks before accident. No general illness around that time. On Nov. 10, 1941, felt pain across the shoulders. Became gradually worse for 2 or 3 days when shovelling sand. Suddenly, when lifting, something at base of neck went snap, producing intense pain in the shoulders, severe for about a week but gradually eased after that. X ray showed fracture and downward displacement of the spinous process of 7th cervical vertebra.

Progress: Returned to work a month after the injury without disability.

Remarks: Complained for 3 days previously of vague pain across the shoulders. The accident was sudden when lifting. He felt severe pain.

Case 3.—Age 23. Dairyman before war. Heavy work for 7 weeks before accident. Had diphtheria about 2 months previously. On Oct. 1, 1941, complained of pain in shoulders and had 11 days off. The first 3 days he was back at work the pain got gradually worse. On Oct. 14, when picking up a shovelful of sand in a crouching position, felt a sudden click in back and something gave way with a severe pain at the base of the neck, causing him to fall to his knees. It was 2 to 3 hours before he could move his shoulders and 3 days before he could take off his own coat. After 14 days' rest, he attempted to work one day but the pain was as bad as before. Complained of a hard lump in his neck and of pain radiating down to his elbow. On Dec. 10, still got pain in his neck when he tried anything heavy, also pain like needles sticking into his spine. X ray showed fracture and downward displacement of the spinous processes of 6th and 7th cervical vertebræ. No fractures of the bodies of the vertebræ were evident.

Progress: After Dec. 24, worked for 6 months when he reported sick, complaining of cough and wasting of left trapezius and left sternomastoid muscles. X ray showed a doubtful old fracture of body of 7th cervical vertebra. He gave a history of an injury to his back as a child. (This seems to have no relation to the shoveller's fracture.)

Remarks: 14 days before the trouble began, had vague pains in his back. The final accident was sudden, in a stooping posture; felt the snap at the instant of taking the weight on the left arm. Question arises, whether the 6th and 7th vertebræ were fractured separately, one 14 days after the other?

Case 4.—Age 21. Manual labourer before war. Heavy work for 7 weeks before accident. No general illness around that time. On Oct. 27, 1941, his shoulders began to "catch him" on his upstroke with a loaded shovelful of sand. N sudden origin. Only troubled him in extreme movement Pain got gradually worse and he said he could feel the bon in his back grating. X ray showed a half centimetre of downward displacement of the fractured spinous process of th 7th cervical vertebra.

Progress: No pain after the third week. Went to work month after the injury without disability.

Remarks: Gradual onset. The position he was in when th pain caught him was always at the beginning of the upstroke

Case 5.—Age 25. Labourer and deliveryman before war Heavy work for 7 weeks before accident. Developed pneumonia a month later (Nov. 25). On Oct. 20, 1941, complaine of pain in his neck and of difficulty in hanging his coat up Carried on working for 2 days when the pain became worse Had 7 days' rest and was somewhat easier. On Oct. 2 in the afternoon of his first day back at work, when heavin a shovelful of sand at a truck was halfway through a strok when something clicked in his back and he could not straighte his shoulders. Had acute pain for 2 hours between hi shoulder-blades. During the next month complained of pai whenever he lifted anything with his left hand. The pai eased off after this but some tenderness remained at the side of the 7th spinous process. X ray showed 2 cm. downwar displacement of the spinous processes of the 6th and 7t cervical vertebræ.

Progress: Returned to work without pain on Nov. 20, 1941 After his pneumonia he complained no more of pain.

Remarks: 9 days before the accident had pain in the bac of his neck. The accident was sudden; he was in a stoopin position and had just taken the weight on his left arm whe he felt the snap. Question arises whether the 6th and 7t cervical vertebræ were fractured separately, one 9 days afte the other.

Case 6.—Age 24. Labourer before war. Heavy wor for 10 weeks before accident. Developed pneumonia o Dec. 30, 1941, and had influenza the week before the accident On Dec. 16, 1941, felt sudden pain between shoulders whil shovelling at the end of a day's work. Pain cleared up b Dec. 28, and he had little disability except for slight tender ness for the first 2 weeks over the spines of the 6th and 7t cervical vertebræ. Later, when he returned to his work i February, after his pneumonia, he complained of grating an an ache in his back whenever he did any lifting. X ra showed downward displacement of the spinous processes of the 6th and 7th cervical vertebræ.

Progress: On account of the pain across the shoulders, and for complicating emotional reasons, has only been on light work since. Little disability evident.

Remarks: The accident was the first complaint. Sudden pain between the shoulders. (Only one accident responsible for avulsing two spinous processes.)

CASE 7.—Age 21. Chemist's assistant before the war. Heavy work for 24 weeks before accident. Nutritional oedema for 3 months, beginning in August, 1941. In June, 1942, at 8 o'clock one morning, when filling his first skip with sand from a low position and taking the strain of each shovelful on his left arm, he felt a click and severe sharp pain between his shoulder-blades, at the root of his neck. The shovel fell out of his hand and he thought his arm was paralysed. He walked with his head and neck bent forward and to the left to ease the pain. It proved painful for him to raise his arms more than 20° from his side. He had 3 days of [illegible] pain [illegible] even when lying in bed. The spinous process of 7th cervical vertebra was tender and the skin over it slightly swollen. After 7–10 days had no pain except on lifting. The fragment was not [illegible] on first examination. X ray showed fracture of spinous process of 7th cervical vertebra.

Progress: By Feb. 17, 1943, had very little disability, except a tired feeling in the shoulder towards the end of the day. Has done no manual work since.

Remarks: The accident was the first complaint. It was sudden, in a stooping position, at the instant he took the strain of the shovelful on the left arm.

CASE 8.—Age 29. Bricklayer and labourer before war. Heavy work for 11 weeks before accident. Nutritional oedema in winter 1941–42. On Sept. 18, 1942, was throwing hard soil upwards at a distance of 6 ft. with a shovel when at every shovelful felt a pain under his left shoulder-blade; he thought he had the sensation from the damp. The ache under his shoulder got gradually worse. He rested after doing 5 skips and complained that something was wrong with his back. On starting work again, as he dug his shovel into the soil for the 11th shovelful he felt something snap at the base of his neck. He tried to straighten up but failed, felt faint, and dropped his shovel. After sitting down for half an hour he felt better and could walk home. The pain then eased off, except when he was lifting. On first examination, there was some tenderness and redness over the 7th spinous process. X ray showed fractured spinous process of 7th cervical vertebra.

Progress: By Feb. 10, 1943, there was no disability.

Remarks: Had complained of pain under the left scapula all morning. The accident was sudden, in a stooping position, at the instant of taking the strain of a shovelful on the left arm.

PATHOLOGY

The lesion is a fracture of the spinous process of the 7th (or 6th and 7th) cervical spinous process about its middle. The line of fracture, running at right-angles to the long axis of the process, was evident radiologically in every case. The cause must have been muscular pull—i.e., indirect violence. In no case was any rarefaction or excessive calcification of the bone evident. In most cases there was also separation of the fragments with downward displacement of the detached fragment (fig. 2). In some cases there was over-riding with subsequent depression of the spinous prominence (fig. 1). In early cases this was camouflaged by redness and inflammation around the process. One case demonstrated the anterior bending (fig. 3). In no antero-posterior radiogram was any lateral displacement to be seen. When the ligamentum nuchæ was relaxed by hyperextension of the neck, crepitus and movement of the fragment could usually be elicited.

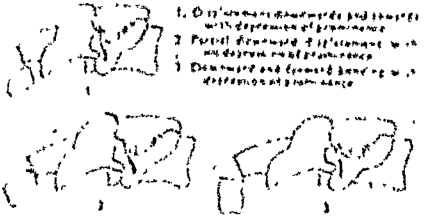
An interesting factor is the premonitory phase of pain in the back, present in some cases for a few hours or days before the actual snap or click in the neck, which can be considered as marking the breaking of the bone.

DISCUSSION

These eight men were taken prisoner in Greece or Crete in the spring of 1941, and after varying fortunes and conditions travelled to Germany. They spent up to a month in a transit camp at Salonica, where the conditions as regards food were poor compared with the standards to which they had been accustomed. While in Germany during August and September their ration was at a maintenance level and did not restore the general condition of these men very rapidly. To judge from the slow healing of skin ulcers and the number of cases of nutritional oedema, there was an essential lack of basic nutritional factors in the diet.

These 8 cases are from about 1100 British soldiers, working during the first months of captivity. Subsequently another 7 men developed this condition, but owing to changes of Stalag I have not had the opportunity of collecting details. The 15 cases observed all occurred during their first year of work.

Although everyone was not shovelling all the time, they were on this type of work for about two-thirds of the twelve months. No cases showed any previous predilection to fractures (with the possible exception of case 3), or gave any rheumatic history or evidence of nutritional deficiency before capture.



1. Over-riding of fragments and fracture with depression of prominence
2. Partial downward displacement with no depression of prominence
3. Downward and forward bending with depression of prominence

A noticeable fact was that although a considerable proportion of the 1100 men were conscripts and war-time soldiers from office and non-manual jobs, and others were regular soldiers, these classes were relatively free—only 2 of the 8 men had had sedentary jobs before the war, and none were regular soldiers. Generally speaking, those affected were of good physique and accustomed to hard manual labour. The accident did not happen as soon as the man started the shovelling work but after at least 6 weeks' employment, while some cases occurred several months later, by which time one would expect the spinous process to have become adjusted to the stresses and strains of this work. (Case 4 had been a manual labourer before joining the Army and had been used to similar work, yet he sustained this fracture 7 weeks after beginning to shovel sand as a prisoner-of-war.)

Poor nutrition, being common to all the cases, seems a possible contributory cause, but unfortunately no detailed inquiry could be made into the patients' vitamin status, or into the protein, fat, and carbohydrate contents of the diets.

Shovelling is undoubtedly the
In 6 cases the bone fractured
process and in 3 cases the
reports the first dorsal being
found this even among the other 7 cases not reported here). Thus it seems that the vertebra prominens is the one most liable to this injury, and as the 6th is often equally prominent it may also be involved. The ligamentum nuchæ is attached to these spinous processes and continues towards the occiput with a fibrous sheet connecting it to the spines of the other cervical vertebræ. In a stooping position this ligament is taut, and on account of its continuation
t
s

attachments to the spines and ligament. In this area we have the rhomboideus minor, the trapezius, and the splenius capitis of both sides. In fixing the scapula before taking weight on the left arm, the left serratus magnus plus the above 3 muscles (the splenius is supplementary) and the rhomboideus major of the left side are made to contract. If for some cause—e.g., fatigue, fibrositis, &c.—there is imbalance here in the contralateral opponents, then the strain of the lift when it is
the left arm ar ansferred on to
bone and exert each the back-
on the most pr directed action
ular origin, the
7th or 6th spines and the ligament in that area, probably

via the rhomboideus minor and the trapezius. One day, probably after repeated shearing stresses, the strain is severe enough to avulse the spinous process about its middle and displace it downwards and laterally. Then the readjustment of tensions which takes place when the man releases his grip on the shovel will centralise the displaced fragment, but on account of the taut ligament the downward displacement will usually remain.

McKellar Hall (1940) recommends early excision. This seems to be unnecessary at an early stage, a view supported by the early study in Germany and by Watson-Jones (1941). In all the present cases (except no. 3, whose peculiar complications I hesitate to attribute to this fracture) there has been very little disability after a month's rest from heavy work. The cases have been treated with heat and rest, progressing to graduated exercises, and at no time was there any indication for surgical removal of the fragment, which, in all probability, would cause more lasting weakness than the injury. The ultimate healing is only by fibrous union.

SUMMARY

Eight cases of fracture of the spinous process of the 7th, or 6th and 7th, cervical vertebra are described in prisoners-of-war shovelling sand or soil.

Besides the men's occupation, there are possible predisposing factors—nutritional deficiency, and muscular fatigue and incoordination.

Conservative treatment only is required for recovery.

It seems probable that many cases are overlooked.

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UREA AND SULPHONAMIDE TREATMENT OF *BACT. COLI* MENINGITIS

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PENETRATING wounds of the brain in the casualties from Normandy have, in most cases, responded favourably to proper general and surgical management, including the administration of penicillin and sulphonamides. Wounds infected not only with streptococci and staphylococci, but also with clostridia have conformed with this rule. The most dangerous organisms in these cases have generally proved to be gram-negative bacilli—*Bact. coli* and related bacteria. It is academic to consider whether these organisms can produce a primary infection of the central nervous system such as brain abscess, encephalitis, and meningitis. But it is of great practical value to know, first, that they usually occur in the nervous system together with other organisms, and secondly, that such other organisms usually yield promptly to the effect of penicillin and sulphonamides. The gram-negative bacilli alone may, in pure culture, lead to a fatal issue.

Laboratory reports [1] indicate that, though the growth of sulphonamide-resistant gram-negative bacilli or gram-positive cocci is not impaired by sulphonamides or urea alone, it is inhibited by the combination of urea and sulphonamides. The unpublished experience of Captain Max Kutzer and Captain Raymond Rhodes, of a (US) General Hospital, shows that gonorrhœa, which had resisted treatment with both sulphonamides and penicillin in adequate dosage, responded to this combination of urea and a sulphonamide.

CASE OF *Bact. coli* MENINGITIS

A soldier received a penetrating wound of the brain in Normandy on June 14, 1944, when he was struck by a shell fragment about 1 cm. in diameter. The entrance wound was 1·5 cm. long and situated just below the inner end of the left eyebrow. The missile penetrated both tables of the left frontal sinus, crossed the midline and came to rest in the right occipital lobe of the brain. The patient also had three minor wounds from shell fragments in the limbs. On June 15 he was given sulphadiazine, and it was observed that his mental responses were slow. On the 16th all his wounds were debrided and sulphanilamide powder was applied to them. He looked ill, his tendon reflexes were diminished, and his neck was stiff. There was much pus in the nose and some in the pharynx. The spinal fluid, which was both sanguineous and purulent, contained 750,000 red ce[illegible] cells per c.mm. The white cells were [illegible] and no organisms were seen on the smear. There is no report of bacteriological culture. The patient was given 5 grammes of sulphadiazine intravenously and then 2 g. by mouth every four hours.

By the 21st he had improved considerably, but drowsiness and neck rigidity persisted. Accordingly sulphadiazine was continued, but the dosage was reduced to 1 g. every four hours. There was moderate infection of the wound below the supraorbital ridge.

The patient did well until July 3, when he complained of a severe headache and chilly sensations. There was rigidity of the neck, and spinal puncture revealed cloudy fluid under increased tension containing 1430 white cells per c.mm., of which 83% were neutrophils. No organisms were seen on the smear. A report of bacterial culture is again lacking. Penicillin, 3000 units, was injected intraspinally, and sulphadiazine was again given by mouth.

When he was adm[illegible] hospital on July 5 the wound in the left [illegible] was healed. There was no neck-rigidity and the patient seemed in good condition. The nasal mucous membrane looked normal. X-ray films revealed bone fragments in the pole of the left frontal lobe. It was decided to remove these fragments and patch the defect in the dura, so as to seal the frontal sinus from the subarachnoid spaces and the brain.

Accordingly on July 7 a left frontal craniotomy was carried out, with pedicled periosteal graft to dura. Through a medium-sized left frontotemporal incision in the scalp, a small left frontal osteoplastic bone flap was made. The periosteum underlying the scalp was reflected forwards as a separate layer to be used as a pedicled graft. An extradural approach was made to the left anterior fossa. Several loose bone fragments between the posterior wall of the left frontal sinus and the hole in the dura were removed. The dural defect was 1 cm. in diameter. A small amount of yellowish fluid was found in the brain, consisting of pus and necrotic cerebral tissue. All bone fragments were removed from tl brain, as far as the surgeon's finger could feel. A portab X-ray film likewise revealed no residual bone fragment Penicillin and sulphanilamide powder was placed in tl different layers of the wound, which was closed with inte rupted black silk sutures in layers and without drainag

LABORATORY OBSERVATIONS

Date in July	Spinal fluid									Blood conten (mg. pe 100 c.cn	
	Pressures (mm. H_2O)	White cells (per c.mm.)	Polymorphs %	Chemical contents (mg. per 100 c.cm.)				Bacterial smears	Culture *Bact. coli*	Sulpha-diazine	Urea (as
				Total protein	Urea (as nitrogen)	Sulpha-diazine	Sugar				
15	320	232	100	180	..	..	None	+	+	..	..
16	480	40,000	100	490	..	..	10	+	+	..	..
17	..	27,000	100	..	..	..	..	+	+	..	..
20	150	2200	93	..	..	..	.	−	+	7	5
21	..	100	45	..	52	4·5	..	−	+	9	2
23	170	110	55	132	..	..	76	−	−	8	37
26	200	280	34	130	..	.	..	−	−	9	..

Although the patient had had meningitis there were no dens adhesions between brain and dura.

Specimens for bacterial study were taken from the lef frontal sinus, the dural defect, and from the part of the brai from which the bone fragments were removed. Direc smears of each of the three swabs revealed occasional pu cells and gram-positive cocci. Cultures of each of the specimens grew *Streptococcus viridans* and *Bact. coli*. The streptococcus was sensitive to penicillin in vitro, but the *Bact. col* was completely insensitive.

After the operation, the patient was given 1 g. of sulphadiazine by mouth and 20,000 units of penicillin parenterall

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[1] [illegible], H. M., Tenenberg, D. J., Strakosch, E. A., Clark, G. *Proc. Soc. exp. Biol. N.Y.*, 1942, 51, 245.

DISCUSSION

It is believed that p-aminobenzoic acid is essential for growth of bacteria and that sulphonamides, which have a similar chemical structure to this substance, are therefore taken up by the bacterial enzyme system. How urea acts is not exactly known, but it has the same [illegible] in its molecule attached to a carbon atom as have the sulphonamides and p-aminobenzoic acid, the amide and the carboxyl, or acid, radical. In any event, in vitro,[2] combinations of sulphonamides and urea possess a bacteriostatic effect even in the presence of the sulphonamide inhibitor p-aminobenzoic acid.

Urea is a diuretic, so it is especially important to maintain an adequate fluid intake in patients who are receiving it [illegible] In this case the, d[illegible] when the patient [illegible] 1·2 g of sodium [illegible] of our patients who receive such dosage of these drugs run a blood level of sulphadiazine between 13 and 15 mg per 100 c.cm. The relatively low level in this case can probably be attributed to diuresis induced by the urea.

In two other patients who had bone fragments removed from the brain, bacterial cultures revealed gram-negative bacilli (*Bact. aerogenes*) in addition to gram-positive organisms. A watertight closure of the dura was made in each case, and 30 g. of urea was given by mouth every four hours for [illegible] and [illegible] days respectively, in addition to the usual postoperative courses of penicillin (20,000 units intramuscularly), and sulphadiazine (1 g. by mouth four hourly). There was no evidence of intracranial sepsis in either of these cases several weeks after the operation. These experiences bring out the possibility of primary watertight dural closure, even in the presence of gram-negative organisms. Since the advent of penicillin, Cairns[3] has clearly recognised the growing significance of these bacteria in the brain.

Urea and sulphanilamide have also been used topically in a few cases of brain fungus with gram-negative bacilli without notable success in eliminating these organisms from the surface of the wounds. The systemic administration of these drugs, however, does seem to prevent the development of encephalitis and ventriculitis from these organisms which had occurred in other cases where urea was not employed. Further work along these lines is required before positive conclusions can be drawn.

SUMMARY

A case of meningitis due to *Bact. coli*, which failed to respond to sulphadiazine and penicillin, recovered after receiving 2 g. of sulphadiazine and [illegible] g. of urea introduced into the stomach every four hours.

ALLERGIC REACTIONS TO PENICILLIN

A. [illegible] BARKER, M.R.C.P.

MAJOR R.A.M.C.

One of the outstanding characteristics of penicillin is its lack of toxicity (Florey and Jennings 1944); untoward reactions have been thought to be due to impurities. Lyons (1943) reports an urticarial reaction in 12 out of 20[illegible] patients receiving penicillin therapy, some having had local applications only. Pyle and Rattner (1944) record a case of dermatitis venenata in a doctor responsible for preparing and administering penicillin in a general hospital; the three medical officers who subsequently handled the penicillin also experienced slight itching of the face and penis, though no dermatitis developed. The two cases of skin reactivity to penicillin, or other products of *Penicillium notatum*, here reported also illustrate the skin lesions that may arise from handling penicillin products or from intramuscular injections of penicillin.

CASE 1.—A medical officer in charge of the penicillin laboratory at a large military hospital had handled penicillin for 7 months under laboratory conditions without ill effect. In September penicillin solutions were required at the rate of three to eight million units a day. Each bottle [illegible] contain 2 [illegible] units, so it was necessary to transfer the dissolved contents of one bottle to another. The doctor did this with a syringe, and some of the solution leaked past the piston of the syringe on to his hands. The day after the first dispensing he noticed a pruritus of the shaving area but this was dismissed as a shaving rash due to a blunt razor blade. Two days later he went on leave and the irritation disappeared without any local treatment. On his return he continued to dispense the penicillin solutions, and within 2 days developed an acute dermatitis of the face and neck which was accompanied by oedema of the upper and lower eyelids and a feeling of tightness of the rest of the skin of the face. No other area was affected. Next day vesiculation with a serous exudate was observed on the chin. Shaving soap was considered as a cause at first but it was thought that it [illegible]

[illegible] contamination of the fingers or hands but direct transfer of the penicillin by the fingers to the face seemed possible. As a precaution the patient stopped dispensing but continued laboratory work with penicillin. The rash subsided within a week with twice daily applications of lotio calaminae and by restricting shaving to a minimum.

When all clinical signs of dermatitis had disappeared patch tests were performed with a solution of penicillin as dispensed (20,000 units per ml.) and as a control with a solution of the same concentration which had been autoclaved. The penicillin solution produced an eczematous reaction within 12 hours, and the site showed pigmentation 2 weeks later. The control was negative. Photosensitisation, often seen in sulphonamide dermatitis, was not observed.

Strong solutions of penicillin have a distinctive odour, described as reminiscent of urine-soiled baby's napkins; the patient reported that some hours after he noticed the smell the skin of his face began to itch. He had noted this on several occasions. It is possible that the irritant is volatile since the solution becomes innocuous on autoclaving. If this is so it would account for the selection of the face as the site first attacked. Incidentally, the solution which was pale yellow turned a dark brown in the autoclave [illegible] change. The irritant cannot [illegible] because present-day products [illegible] than penicillin, though judged [illegible] powder used at this hospital was of a high degree of purity.

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[2] Loc. cit. p. 247.

[3] Cairns, H. *Proc. R. Soc. Med.* 1944, 37, 371.

The doctor had not experienced an allergic reaction before, or suffered from eczema. There was no evidence of fungus infection which might have rendered him sensitive to a mould product occurring as an impurity in the penicillin.

CASE 2.—A man aged 25 attended hospital with a giant urticarial reaction on the trunk and extremities. He was wounded in the right forearm in Normandy, and after surgical toilet was treated with intramuscular injections of penicillin for 4–5 days. At the end of this period he developed an urticaria which had persisted for 4 weeks. The dose and make of penicillin are not known.

He was covered with large confluent weals on the trunk and extremities and exhibited dermographism. He said he had never suffered with any skin disease. Scratch and intradermal tests were performed using 0·1 ml. of penicillin solution of the same strength as in case 1, this being thought to be the strength injected originally; the same solution was autoclaved as a control. Within half an hour the penicillin solution produced an urticarial weal but the control had no effect. The weal persisted for 24 hours and slowly disappeared. There was no evidence of current fungus infection.

Personal idiosyncrasy cannot be entirely ruled out in these cases, but the delay in onset of the symptoms is significant. Sensitisation due to a previous fungus infection is a possibility in both cases but in sixty-odd men treated locally with penicillin neither dermatitis nor urticaria was observed. It is unlikely that all of those men had escaped tineal infection in view of its wide distribution and therefore it is improbable that this factor played any part in the two cases reported here. The absence of reactions to penicillin in the patients treated by local applications may be due to the weak concentration used (200 units per ml.).

Patch-tests of penicillin solution of the same strength as in case 1 were applied to the dispenser to whom the preparation of the penicillin was to be relegated. Both test and control were negative. As a precautionary measure he was instructed to wear rubber gloves. He has shown no ill effects.

SUMMARY

Two cases of skin reaction to penicillin are described—a dermatitis venenata and an urticaria. Both have been confirmed by positive reactions to cutaneous tests. Controls, using the same strength of penicillin modified by autoclaving, were negative.

I wish to thank Brigadier R. M. B. MacKenna and Colonel F. R. Laing for permission to publish this article.

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EFFECT OF RUBBER TUBING ON SOLUTIONS OF PENICILLIN

S. T. COWAN, M.D., DIPL.BACT. MANCH.
MAJOR RAMC

INTRAMUSCULAR infusion appears to be the method of choice for systemic penicillin therapy; the thrombosis of veins associated with intravenous treatment, and the disturbance of the patient for repeated intramuscular inoculations are avoided, and an adequate blood concentration can be maintained throughout (Morgan et al. 1944). The volume administered however must be kept small, which is a disadvantage because the flow is so slow that the needle readily blocks, and the penicillin solution is kept in contact with the rubber tubing for several hours. The object of this paper is to show that some samples of rubber tubing are unsuitable for use in the infusion apparatus because they inactivate some of the penicillin in solution.

EXPERIMENTAL

Assay of penicillin.—All assays except those in section 4 were made on at least 16 plates. In experiments 1 and 2 the Oxford method (Heatley 1944) and a modification of Schmidt and Moyer's method (1944) were run in parallel; in the other [illegible] the Oxford method was used. A large-scale experiment to determine the error of the method in my hands showed that for one solution it was about 15% (coefficient of variation 6·3) when 4 plates were used and about 7·5% (CV = 2·8) with 16 plates. Allowing another 7·5% for errors of dilution (a separate pipette was used for each decimal dilution) the total error is probably about 15% for a 16 plate assay.

Sterility tests.—One ml. of each solution of experiments 4 to 7 was inoculated into broth containing sufficient penicillinase to inactivate the whole of the inoculum. The penicillinase was kindly supplied by Surgeon Lieut.-Commander H. W. Clegg, RNVR.

1. *Natural rubber tubing.*—Narrow tubing (3·5 mm. in diameter) made of natural rubber was cut up into 1-inch lengths, of which one was sterilised by boiling for 15 min., another by autoclaving at 5 lb. for 30 min., and a third at 15 lb. for 15 min., but the way in which the tubing was sterilised made little difference to the results of the tests to be described. The sterilised pieces were placed in small screw-capped bottles containing penicillin solution, and an additional bottle of the same solution was kept under the same conditions, but without rubber, as a control. Samples were removed from the bottles, diluted and assayed. The results (table I) showed (*a*) that in certain circumstances this tubing inactivated some of the penicillin solution in contact with it, (*b*) that the tubing had a greater action after repeated sterilisation than when it was new, and (*c*) that although the reduction in strength only became significant after twelve hours at room temperature the action probably started earlier and was progressive. The results also suggested that some of the penicillin used in continuous intramuscular therapy might be inactivated before it reached the patient.

TABLE I—ASSAY OF PENICILLIN SOLUTIONS AFTER CONTACT WITH RUBBER TUBING IN GLASS BOTTLES

Expt no.	Times sterilised	Duration of contact (hr.)	Temperature (° F)	Penicillin in units per ml.		
				Tubing sterilised by—		Control (no rubber)
				Boiling	Autoclaying	
1	1	24	67–75	787 (*98*)	752 (*94*)	800
2	2	24	64–69	588 (*100*)	456 (*78*)	587
3	13	0	66	..	..	1010
		2	67	925 (*98*)	870 (*93*)	940
		4	67	1020 (*95*)	1020 (*95*)	1070
		8	68	980 (*98*)	920 (*92*)	1000
		12	67	875 (*85*)	885 (*86*)	1030
		18	67	800 (*82*)	760 (*78*)	970
		24	68	730 (*72*)	660 (*65*)	1010

Figures in parentheses are percentages of the control solution.

2. *Bench tests of the "Eudrip 3" apparatus* (McAdam et al. 1944).—The first set received for trial was fitted with red synthetic rubber tubing. In these experiments an attempt was made to imitate conditions at the bedside. The reservoir bottle was fixed 4 ft. above the bench and the last 3 ft. of tubing was strapped to the bench; the needle delivered into a sterile separating funnel below bench level. The apparatus was sterilised in a theatre autoclave at 10 lb. for 10 min. A control solution was kept on the bench, and this was renewed when the reservoir bottle was changed. In experiment 5 sodium penicillin solution, freshly prepared daily, was run through the apparatus for 4 days at the rate of 100 ml. a day; on the fifth day the flow was slowed to 80 ml. in 24 hours to represent partial blockage of the needle. In addition to the control solution kept on the bench the contents of the solution remaining in the reservoir were assayed each day. The results of some of these experiments are shown in table II.

Several sets of "Eudrip 3" were received fitted with black rubber tubing which was soft and elastic and became sticky on autoclaving; bench experiments with one of these sets (experiments 6 and 7 in table II) showed no appreciable inactivation of penicillin.

3. *Trial of the "Eudrip 3" in treatment.*—One of the sets fitted with black tubing was used in the treatment of a patient by the intermittent method suggested by Bigger (1944). Whenever the reservoir bottle was changed a small bottle containing the same solution was strapped to the stand; 18–26 hours later a sample of solution was collected from the tubing near the needle by

TABLE II—[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]		[illegible]
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
		[illegible]	[illegible]		[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]

[illegible]

instead of a dry all-glass syringe, and this and the control solution were assayed. To determine the adequacy of the treatment urine and blood were collected and the bacteriostatic levels titrated (table III). Blockage of the needle was troublesome in the first course of treatment and occurred after approximately 18, 11, and 20 hours [illegible]. A wider needle was used subsequently. Three sets fitted with similar black tubing have been used on another patient, and samples from the tubing and the serum concentrations have been satisfactory.

4. *Testing the suitability of rubber tubing for penicillin infusion apparatus.*—The variation in effect on penicillin of different kinds of rubber tubing necessitates a test to pick out the deleterious ones. Running strong solutions through the whole apparatus is wasteful of penicillin, and a simple test was made by immersing a 1-inch length of sterilised tubing in 10 ml. of penicillin solution containing about 100 units per ml. Together with a control of the same solution without rubber tubing the test bottle was placed in the incubator and assays on 4 plates were made after 3 hours at 37° C. This temperature was chosen because room temperature is variable and every laboratory has an incubator at 37° C; further, if the inactivation of penicillin is due to a chemical reaction it should be speeded up at the higher temperature. Red rubber from [illegible] of the control solution, figures which are in good agreement with those previously obtained.

DISCUSSION

The validity of any conclusions drawn from these experiments depends on the absence of contamination and the accuracy of the assays. The solutions of all the experiments recorded here were sterile but it was found that contaminated penicillin was inactivated even more quickly in the presence of rubber than in its absence. The 16-plate modification of the Oxford method of assay has a total error of about 15% so that any deterioration greater than that was probably real and not due to experimental error.

The Edinburgh workers (McAdam et al. 1944) and Osborne (1944) reported satisfactory serum concentrations in patients treated by intramuscular infusion; they were fortunate in their choice of rubber tubing. The first "Endrip 3" sets supplied to the Army were fitted with tubing which inactivated 25–50% of the penicillin but this fault was quickly rectified. The tubing now supplied has no obvious deleterious action as shown by bench and bedside tests of the solutions in the tubing and by the bacteriostatic power of the serum and urine.

The colour of the rubber is probably without significance. Tests should be made on any tubing which is to come into contact wi[illegible] samples producing appreciab[illegible] be used. The rubber caps of [illegible] l by one American firm have been tested by keeping a bottle inverted after the addition of sterile water so that the solution was in contact with the rubber cap; the rate of deterioration at room temperature ran parallel with that

TABLE III—ASSAYS OF PENICILLIN IN [illegible] AND BACTERIOSTATIC POWER OF PATIENT'S SERUM AND URINE DURING TREATMENT BY MEANS OF A "ENDRIP 3" SYSTEM WITH BLACK RUBBER TUBING

Length of [illegible] (hr.)	Hours [illegible]	Hours bottle [illegible]	Penicillin [illegible]: Bottle	Penicillin [illegible]: Tubing	Serum	Urine units per ml.
First	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Second	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Third	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Fourth	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible] of the solution in another bottle in which it was not in contact with the rubber.

SUMMARY

Rubber was found to have a variable effect on penicillin solutions; some samples inactivated a considerable proportion of the antibiotic and others had no observable effect.

In continuous intramuscular infusion the long contact of solutions with the rubber tubing affords ample time for the destruction of 25–50% of the penicillin if the rubber is unsuitable.

A simple method of testing the rubber is described.

This paper is a summary of a series of reports to the Director of Pathology at the War Office, and I have to thank Major-General L. T. Poole for his permission to publish the findings and for his interest and help throughout the investigations. To Major Charles Gray, RAMC, I am indebted for freedom of action in treating and carrying out tests on his patient.

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Medical Societies

ROYAL SOCIETY OF MEDICINE

At a meeting of the section of epidemiology on Jan. 26, with Sir WELDON DALRYMPLE-CHAMPNEYS in the chair, a discussion on

Jungle Warfare

was opened by Brigadier N. HAMILTON FAIRLEY, FRS. Among troops fighting in the jungle, he said, sickness accounts for anything from 5 to 30 times as many casualties as battle injuries. The sick casualties fill hospital beds and increase transport difficulties, and thus disease becomes of first-class military importance to the Army commanders. Training in tropical hygiene is an integral part of the training for jungle warfare. Because so many diseases are transmitted by insects troops must be adequately clothed. The use of shorts had to be absolutely prohibited; they now wear trousers and gaiters which can be treated with anti-mite fluid, and protect the legs and ankles against the bites of mosquitoes transmitting malaria and dengue. In one 6-months campaign, malaria accounted for 60·8% of sickness casualties, dengue for 17·5%, dysentery and diarrhoea for 6·2%, scrub typhus for 2·5%, and skin diseases, PUO's, &c. for 13·0%. Sickness casualties outnumbered battle casualties in this campaign by 10 to 1.

In the Middle East in 1940, he said, they had been sent a small supply of sulphaguanidine from USA to treat bacillary dysentery cases; they were getting many cases of Shiga dysentery at the time. As the supply was limited they decided to give it only to the more seriously ill patients after the type of dysentery bacillus had been identified. This meant a delay of powder used at this hospital was of a high degree of purity.

The doctor had not experienced an allergic reaction before, or suffered from eczema. There was no evidence of fungus infection which might have rendered him sensitive to a mould product occurring as an impurity in the penicillin.

CASE 2.—A man aged 25 attended hospital with a giant urticarial reaction on the trunk and extremities. He was wounded in the right forearm in Normandy, and after surgical toilet was treated with intramuscular injections of penicillin for 4–5 days. At the end of this period he developed an urticaria which had persisted for 4 weeks. The dose and make of penicillin are not known.

He was covered with large confluent weals on the trunk and extremities and exhibited dermographism. He said he had never suffered with any skin disease. Scratch and intradermal tests were performed using 0·1 ml. of penicillin solution of the same strength as in case 1, this being thought to be the strength injected originally; the same solution was autoclaved as a control. Within half an hour the penicillin solution produced an urticarial weal but the control had no effect. The weal persisted for 24 hours and slowly disappeared. There was no evidence of current fungus infection.

Personal idiosyncrasy cannot be entirely ruled out in these cases, but the delay in onset of the symptoms is significant. Sensitisation due to a previous fungus infection is a possibility in both cases but in sixty-odd men treated locally with penicillin neither dermatitis nor urticaria was observed. It is unlikely that all of those men had escaped tineal infection in view of its wide distribution and therefore it is improbable that this factor played any part in the two cases reported here. The absence of reactions to penicillin in the patients treated by local applications may be due to the weak concentration used (200 units per ml.).

Patch-tests of penicillin solution of the same strength as in case 1 were applied to the dispenser to whom the preparation of the penicillin was to be relegated. Both test and control were negative. As a precautionary measure he was instructed to wear rubber gloves. He has shown no ill effects.

SUMMARY

Two cases of skin reaction to penicillin are described—a dermatitis venenata and an urticaria. Both have been confirmed by positive reactions to cutaneous tests. Controls, using the same strength of penicillin modified by autoclaving, were negative.

I wish to thank Brigadier R. M. B. MacKenna and Colonel F. R. Laing for permission to publish this article.

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EFFECT OF RUBBER TUBING ON SOLUTIONS OF PENICILLIN

S. T. COWAN, MD, DIPL BACT. MANCH.
MAJOR RAMC

INTRAMUSCULAR infusion appears to be the method of choice for systemic penicillin therapy; the thrombosis of veins associated with intravenous treatment, and the disturbance of the patient for repeated intramuscular inoculations are avoided, and an adequate blood concentration can be maintained throughout (Morgan et al. 1944). The volume administered however must be kept small, which is a disadvantage because the flow is so slow that the needle readily blocks, and the penicillin solution is kept in contact with the rubber tubing for several hours. The object of this paper is to show that some samples of rubber tubing are unsuitable for use in the infusion apparatus because they inactivate some of the penicillin in solution.

EXPERIMENTAL

Assay of penicillin.—All assays except those in section 4 were made on at least 16 plates. In experiments 1 and 2 the Oxford method (Heatley 1944) and a modification of Schmidt Moyer's method (1944) were run in parallel; in the other riments the Oxford method was used. A large-scale experiment to determine the error of the method in my hands showed that for one solution it was about 15% (coefficient of variation 6·3) when 4 plates were used and about 7·5% (CV = 2·8) with 16 plates. Allowing another 7·5% for errors of dilution (a separate pipette was used for each decimal dilution) the total error is probably about 15% for a 16 plate assay.

Sterility tests.—One ml. of each solution of experiments 4 to 7 was inoculated into broth containing sufficient penicillinase to inactivate the whole of the inoculum. The penicillinase was kindly supplied by Surgeon Lieut.-Commander H. W. Clegg, RNVR.

1. *Natural rubber tubing.*—Narrow tubing (3·5 mm. in diameter) made of natural rubber was cut up into 1-inch lengths, of which one was sterilised by boiling for 15 min., another by autoclaving at 5 lb. for 30 min., and a third at 15 lb. for 15 min., but the way in which the tubing was sterilised made little difference to the results of the tests to be described. The sterilised pieces were placed in small screw-capped bottles containing penicillin solution, and an additional bottle of the same solution was kept under the same conditions, but without rubber, as a control. Samples were removed from the bottles, dilut and assayed. The results (table I) showed (*a*) that certain circumstances this tubing inactivated some of t penicillin solution in contact with it, (*b*) that the tubi had a greater action after repeated sterilisation than wh it was new, and (*c*) that although the reduction in streng only became significant after twelve hours at roo temperature the action probably started earlier and w progressive. The results also suggested that some of t penicillin used in continuous intramuscular thera might be inactivated before it reached the patient.

TABLE I—ASSAY OF PENICILLIN SOLUTIONS AFTER CONTACT WITH RUBBER TUBING IN GLASS BOTTLES

Expt no.	Times sterilised	Duration of contact (hr.)	Temperature (° F)	Penicillin in units per ml.		
				Tubing sterilised by—		Control (no rubber)
				Boiling	Autoclaving	
1	1	24	67–75	787 (*98*)	752 (*94*)	800
2	2	24	64–69	588 (*100*)	456 (*78*)	587
3	13	0	66	..	..	1010
		2	67	925 (*98*)	870 (*93*)	940
		4	67	1020 (*95*)	1020 (*95*)	1070
		8	68	980 (*98*)	920 (*92*)	1000
		12	67	875 (*85*)	885 (*86*)	1030
		18	67	800 (*82*)	760 (*78*)	970
		24	68	730 (*72*)	660 (*65*)	1010

Figures in parentheses are percentages of the control solution.

2. *Bench tests of the "Eudrip 3" apparatus* (McAda et al. 1944).—The first set received for trial was fitt with red synthetic rubber tubing. In these experimen an attempt was made to imitate conditions at the be side. The reservoir bottle was fixed 4 ft. above the benc and the last 3 ft. of tubing was strapped to the bench the needle delivered into a sterile separating funnel belo bench level. The apparatus was sterilised in a theat autoclave at 10 lb. for 10 min. A control solution w kept on the bench, and this was renewed when t reservoir bottle was changed. In experiment 5 sodiu penicillin solution, freshly prepared daily, was ru through the apparatus for 4 days at the rate of 100 ml. day; on the fifth day the flow was slowed to 80 ml. i 24 hours to represent partial blockage of the needle. I addition to the control solution kept on the bench t contents of the solution remaining in the reservoir we assayed each day. The results of some of these exper ments are shown in table II.

Several sets of "Eudrip 3" were received fitted wit black rubber tubing which was soft and elastic and be came sticky on autoclaving; bench experiments with on of these sets (experiments 6 and 7 in table II) showed n appreciable inactivation of penicillin.

3. *Trial of the "Eudrip 3" in treatment.*—One of th sets fitted with black tubing was used in the treatmen of a patient by the intermittent method suggested b Bigger (1944). Whenever the reservoir bottle wa changed a small bottle containing the same solution wa strapped to the stand; 18–26 hours later a sample o solution was collected from the tubing near the needle b

TABLE II—ASSAY OF PENICILLIN SOLUTIONS BEFORE AND AFTER PASSING THROUGH RUBBER TUBING OF "EUDRIP 3" SETS

Expt no.	Times sterilised	Sample collected after (hr.)	Penicillin in units per ml Needle	Reservoir	Control (on bench)
4	1	4–5	490 (*62*)		790
		8–9	425 (*59*)	..	720
		23–24	470 (*66*)	..	714
5	3	4½–5½	53 5 (*52*)		102 5
		20–21	55·75 (*56*)	102 5	100
		47–48	74 5 (*66*)	109 (*96*)	113
		71–72	78 6 (*70*)	108 (*96*)	112 5
		96–97	76 8 (*76*)	101 (*100*)	101
		116–117	81 6 (*69*)	116 (*99*)	117·5
6	1	3½–4½	711 (*91*)	..	784
		7½–8½	705 (*92*)	..	768
		21–21½	720 (*88*)	800 (*98*)	820
7	10	16–16½	968 (*100*)	.	968

Red rubber tubing was used in experiments 4 and 5 and black tubing in experiments 6 and 7.

TABLE III—ASSAY OF PENICILLIN IN TUBING NEAR NEEDLE AND BACTERIOSTATIC POWER OF PATIENT'S SERUM AND URINE DURING TREATMENT BY MEANS OF A "EUDRIP 3" FITTED WITH BLACK RUBBER TUBING

Sterilisation [illegible]	Hours [illegible]	Ho[illegible]	Penicillin units per ml. [illegible]	Tubing	Serum	Urine units per ml.
First	26	26	4050	3800 (*94*)	1 : 8	80 (DM)
	50	24	3450	3530 (*102*)	1 : 8	Con.
	76	23	3600	3630 (*98*)	1 : 8	160 (DM)
Second	23	23	3675	3450 (*94*)	1 : 4	80 (DM)
	46	20	1600	4400 (*96*)	1 : 8	160 (DM)
Third	18	18	4320	4240 (*98*)	1 : 8	94 (OM)
	41	20	4200	4120 (*98*)	1 : 4	19 (OM)*
* Fifth	17½	17½	4600	4640 (*104*)	1 : 4	160 (DM)
	42½	21	4840	4500 (*97*)	1 : 4	320 (DM)

DM = dilution method using doubling dilutions.
OM = Oxford method.
* Patient had polyuria at the time. Con. = contam [illegible]

means of a dry all-glass syringe, and this and the control solution were assayed. To determine the adequacy of the treatment urine and blood were collected and the bacteriostatic levels titrated (*table* III). Blockage of the needle was troublesome in the first course of [illegible] and occurred after [illegible] use. A wider needl [illegible] fitted with similar bl [illegible] patient, and sampl [illegible]

[illegible] *tubing for penicillin* [illegible] kinds of rubbe [illegible] pick out the deleterious on [illegible] through the whole apparat [illegible] a simple test was made by [illegible] sterilised tubing in 10 ml of penicillin solution containing about 100 units per ml [illegible] of the [illegible] was [illegible] made [illegible] chosen because room temperature is variable and every laboratory has an incubator at 37° C; further, if the inactivation of penicillin is due to a chemical reaction it should be speeded up at the higher temperature [illegible] rubber from the [illegible] (table II) ar [illegible] observatio [illegible] 91% respectiv [illegible] in good agr [illegible]

DISCUSSION

The validity of any conclusions drawn from these experiments depends on the absence of contamination and the accuracy of the assays. The solutions of all the experiments recorded here were sterile but it was found that contaminated penicillin was inactivated even more quickly in the presence of rubber than in its absence. he 16-plate modification of the Oxford method of assay as a total error of about 15% so that any deterioration reater than that was probably real and not due to xperimental error.

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The colour of the rubber is probably without significce. Tests should be made on any tubing which is to me into contact with penicillin solutions, and samples producing appreciable inactivation should not be used. The rubber caps of bottles of powder supplied by one American firm have been tested by keeping a bottle inverted after the addition of sterile water so that the solution was in contact with the rubber cap; the rate of deterioration at room temperature ran parallel with that [illegible]

SUMMARY

Rubber was found to have a variable effect on penicillin sol [illegible]

In [illegible] of [illegible] for [illegible] the long contact [illegible] affords ample time [illegible] of 25–50% of the penicillin if the rubber is unsuitable.

A simple method of testing the [illegible]

[illegible] of [illegible] Ge [illegible] and for his interest [illegible] permission to publish the findings [illegible] Major. To Major Charles Gray [illegible] investigations. [illegible] edom

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Medical Societies

ROYAL SOCIETY OF MEDICINE

At a meeting of the section of epidemiology on Jan. 26, with Sir WELDON DALRYMPLE-CHAMPNEYS in the chair, a discussion on

Jungle Warfare

was opened by Brigadier N. HAMILTON FAIRLEY, F.R.S. Among troops fighting in the jungle, he said, sickness accounts for anything from 5 to 30 times as many casualties as battle injuries [illegible] hospital [illegible] many disease [illegible] fill the Arm [illegible] thus is an int [illegible] to [illegible] training for jungle warfare [illegible] hygiene. Because so many diseases are transmitted by insects troops must be adequately clothed. The use of shorts had to be absolutely prohibited; they now wear trousers and gaiters which can be treated with anti-mite fluid, and protect the legs and ankles against the bites of mosquitoes transmitting malaria and dengue. In one 6-months campaign, malaria accounted for 60 8% of sickness casualties, dengue for 17·5%, dysentery and diarrhœa for 6 2%, scrub typhus for [illegible] diseases, PUO's, &c for [illegible] and skin [illegible] casualties out- [illegible] 10 to 1.

[illegible] treat bacillary [illegible] of sulphaguanidine from USA [illegible], they had been [illegible] to many cases of Shiga dysentery cases; they were getting supply was limited they decided to give it only to the more seriously ill patients after the type of dysentery bacillus had been identified. This meant a delay of

1–2 days before treatment was begun, but nevertheless the results were remarkably good; even cases with ulcers which had been chronic for 3–4 months cleared up in 7–10 days, and sigmoidoscopy showed the ulcers to have healed. Later, in New Guinea, when more supplies became available, they gave sulphaguanidine in the field, as soon as a man reported having diarrhœa, and this measure resulted in a great decrease in the numbers of beds taken up by dysentery patients. Dysentery is now a disappearing disease among Australian troops, and has a mortality of only 1 in 5000. Only 3 deaths from bacillary dysentery were recorded in New Guinea after the introduction of sulphaguanidine therapy; of these patients one had not been treated, one had pneumonia, and one proved at autopsy to have pyelonephritis. During 1942, troops were fighting over the Owen Stanley Ranges under great difficulties, and were forced to defæcate close to the jungle tracks. The whole area became polluted, and severe dysentery developed, hampering operations to such an extent that the safety of Port Moresby was threatened. All available sulphaguanidine was flown up to New Guinea from the mainland of Australia and was given to men with diarrhœa at every regimental aid-post along the line. Within 10 days the epidemic was controlled and the incidence of dysentery reverted to its previous level. If given at onset, the drug terminates the diarrhœa, often in 24 hours, and the organisms in the stools are rapidly reduced in number; this naturally helps to decrease the area of fæcal contamination and infectivity. Sulphaguanidine must be given in large doses, and though costly is effective and safe. The crystals secreted in the urine are soft and unlike certain other sulphonamides in common use it never forms hard concretions. Brigadier Fairley has never seen a case of anuria. The only toxic complications have been nausea, headache, and occasionally maculopapular rashes with or without mild fever. Exfoliative dermatitis or agranulocytosis have never been encountered.

The mortality from scrub typhus, he went on, is 8%. Virulence varies so that the mortality-rate may range from 0 to 30%. Larval mites are responsible for transmitting the infection from rodents, such as rats or field-mice, to man. The troops are taught to use anti-mite fluid on clothing and socks, and when this has been applied they can go where mites are abundant without being bitten. Blankets must also be treated and troops must be warned against taking off their clothes at night. There are patchy areas of high infectivity in the jungle. A rapid system of notification is needed, so that infective areas can be put out of bounds. No specific drug is available to treat scrub typhus. Similarly, there is no known treatment for dengue. The common mosquito to carry the infection is *Aedes ægypti*, but *A. scutellaris* has recently been proved experimentally to be a vector in New Guinea. The mosquitoes have fixed times for biting. Danger can be reduced by clearing the ground round camps, using insecticide sprays, and providing the troops with adequate clothing. They must be warned not to remove their shirts in the daytime during an outbreak. Febrile cases admitted to hospital must be treated day and night under a net.

Speaking of malaria, he recalled a group of 252 soldiers who had escaped from Rabaul and crossed the jungles of New Britain. The medical officer had taken with him all the quinine he could lay hands on. For the first 3–4 weeks he had had enough to treat his men, but during the next 4 or 5 weeks, after supplies had run out, 50 had died of malignant tertian malaria. In the campaigns in New Guinea throughout 1942, the admissions to hospital over 3–4 months about equalled the number of troops involved. In Australia they had investigated experimentally the value of prophylactic quinine on volunteers, giving some grains 5, and some gr. 10 daily. Neither dose was of any value in preventing malignant tertian malaria. In experiments with 'Atebrin' (mepacrine), they found that a breakdown with malignant tertian malaria could be prevented by a daily dose (0·1 gramme), and the blood remained free of parasites. If this dose was continued for 3–4 weeks after the last exposure to infection cure resulted. With benign tertian, however, though men who became infected developed no fever while taking mepacrine, they had a relapse as soon as the drug was stopped, even after long periods. Troops

fig[illegible]riment to determine the error of the [illegible] breaking[illegible] for one solution it was about 1[illegible] crine; when [illegible] when 4 plates were used an[illegible] mepacrine is stop[illegible]es. Allowing another 7·5% [illegible] tertian infection will [illegible] was used for each [illegible] experimentally infected with [illegible] 15% for a[illegible] being subjected to severe physical [illegible]on of [illegible] but even under these conditions mala[illegible] not occur provided mepacrine was taken [illegible] prescribed dosage. Knowledge of these [illegible]ander H. [illegible] findings led to a tightening up of mepacrine [illegible] with most dramatic results. Between December, [illegible] November, 1944, the incidence of malaria in Australian troops in New Guinea fell from 740 per 1000 per year to 36. The death-rate does not exceed 1 in 3000.

DISCUSSION

The CHAIRMAN asked whether Brigadier Fairley had had any experience with the use of sulphasuxidine in dysentery; and whether the anti-mite fluid used was also a mosquito repellent.

Colonel P. G. STOCK referred to some of the forms of tropical clothing designed for jungle warfare, and especially to shorts with a turn-up which could be turned down at night and tucked into the stockings.

Mr. KENNETH MELLANBY, D SC, [illegible] in New Guinea, by the way in wh[illegible] had got the principles of prophylaxis over to his troops. Mepacrine was taken regularly by everybody, and the importance of proper clothing was regarded so seriously that he was himself taken into custody by a military policeman for not wearing gaiters after 5 P.M. It is difficult, he found, to impress troops with the importance of prophylaxis when they are going into areas where the danger of infection is patchy. If the regulations are enforced while they are in a good area the civil population tell them that prophylaxis is unnecessary; they become slack, and it is hard to make them take prophylaxis seriously when they move on into a bad area. The Australians are fighting in hyperendemic areas and it is possible to insist on a stringent rule. He agreed that trousers are necessary in the jungle to protect against malaria and dengue, but he thought shorts treated with anti-mite fluid might be adequate for those wishing to avoid scrub typhus, because the mites only bite covered parts. Wearing clothes treated with anti-mite fluid, he had lain for more than an hour in grass, watching the mites on his boots. Not one bit him.

Brigadier GEORGE MACDONALD agreed with Dr. Mellanby about the difficulty of getting troops to take mepacrine regularly when they have moved from a good to a bad area. He thinks it better to withhold mepacrine until they can be assured that they are now at risk. He mentioned a division, sent to Italy, who were believed to be taking mepacrine regularly. They were sent on a bad journey, and for four hours these 17,000 men were exposed to malarial infection in the Pontine marshes; 500 went down with it. This would never have happened if they had not heard too often the cry "Wolf, wolf."

Dr. R. A. O'BRIEN asked whether mepacrine had been continued indefinitely with any groups of soldiers exposed to benign tertian, to see whether the relapse could be avoided entirely.—Mr. A. FELIX, D SC, FRS, suggested that specific serum for scrub typhus has not been given a real trial.—Sir WILSON JAMESON paid a tribute to the work done by Brigadier Fairley. These Army studies, he said, will make some parts of the tropics much more bearable for Europeans after the war. The fear of malaria has almost gone if we can keep a big Army free of it.—Dr. HUGH STANNUS reminded the meeting that it has lately been shown that we manufacture our vitamins with the aid of the flora in our cæcum. By killing the organisms with sulpha drugs we may cause a vitamin deficiency. He asked whether Brigadier Fairley had seen any cases showing such symptoms.

The CHAIRMAN asked whether there were prospects of any light being shed on the cure of benign tertian malaria. He had seen famine cases in Calcutta come into hospital suffering, apparently, only from malnutrition. When they began to recover from their starvation they were apt to develop other diseases, such as malaria, which had seemingly been suppressed by symptoms.' Was this, he asked, a little suppression of benign tertian by mepacrine [illegible]ing, Brigadier FAIRLEY said that both sulpha[illegible] and sulphasuxidine were specifics for the [illegible]nt of dysentery, but so far he had made no [illegible]ative tests of the two drugs. Their great [illegible] was that they were not associated with renal complications and could be used in dehydrated patients. He had seen no cases of vitamin deficiency following sulphaguanidine. In the South West Pacific no drug known had had any effect on the relapse-rate of benign tertian malaria. In the Middle East 70% of cases had been cured with standard quinine, mepacrine, and pamaquin. Evidently these two strains of *Plasmodium vivax* responded differently to therapy. He undertook to test scrub-typhus serum if Dr. Felix would let him have supplies.

SOCIETY OF MEDICAL OFFICERS OF HEALTH

At a meeting of the fever group on Jan. 12, with Dr. M. MITMAN in the chair, a discussion on

Malaria in this Country

was opened by Mr. P. G. SHUTE (malaria officer to the Ministry of Health). Malaria, he said, was endemic in England as late as the 19th century and reached epidemic proportions in certain areas. In 1917 330 cases arose from infection of anopheles by soldiers returning from abroad; cases were also numerous in 1918, but from 1920 onwards there were very few. In England the only anopheline species likely to be important in malaria transmission is *A. maculipennis*, which is most densely distributed in low-lying marshy districts, and *atroparvus* is the variety medically most important.

Mr. Shute estimated that possibly hundreds of thousands of malaria-infected troops will return to this country at the end of the war, making the spread of malaria to the civil population a foregone conclusion. This prospect, however, is less formidable than it seems. Infection with *Plasmodium ovale* is readily cured, shows no tendency to [illegible] of trouble us in post-war ye[illegible] n man [illegible] nitted, longer [illegible] since [illegible] ropean strains [illegible] infect English [illegible] osquito before the cycle is completed, unless the atmospheric temperature is 75° F or over. In addition the attack in man is fairly readily cured and often burns itself out within six months. Only one indigenous case of MT malaria was reported in this country after the last war. In benign tertian (BT) infection relapses are common and parasites are available to the mosquito in the peripheral blood for some days before clinical relapse. The parasitic cycle can be completed even at low temperature, and heavily infected mosquitoes can remain infective after they have fed as often as 30 times. Infected varieties normally living in close association with man can therefore give rise to many cases of malaria. Mosquitoes infected in early summer are potentially less dangerous, since they have to pay frequent visits to the breeding-grounds and many are drowned in the process. BT malaria, therefore, is the one most likely to arise as an indigenous infection in this country. With high atmospheric temperatures a few cases of MT infection might arise from European strains, but returning troops should not b[illegible] more than a single summer [illegible] t treatment of [illegible] t- ines in view of the known [illegible] particularly in a non-immune population.

In BT infections prophylactic mepacrine offers transient protection only. Returning troops so protected may have their first attack of malaria many months after arrival in this country, and relapses will be frequent.

The first step in any antimalarial measures is treatment of the sick. Neither quinine or mepacrine has gametocytocidal properties, which is the important factor as far as infectivity to the mosquito is concerned. Pamaquin in small doses of 0.02 or 0.03 g. will destroy gametocytes in 24 hours and can be given on the first and second days of relapse. Mepacrine should not be administered at the same time, but quinine can be used. The val[illegible] of the mosquito net should be borne in mind, especially in districts [illegible] Destruction of a few [illegible] case of malaria has [illegible] prevent the disease spreading than the destruction of hundreds or thousands of mosquito larvæ in their breeding-grounds. Action against breeding-grounds is useless at the end of the summer or early autumn, when most indigenous malaria infections are contracted in England, because active breeding will then be over for the year. Measures against the adult insect are preferable to antilarval operations. The insecticide should kill instantly and leave no smell; otherwise mosquitoes may be driven from animal-houses to enter human dwellings. A number of new insecticides are available; DDT appears extremely promising against mosquitoes, [illegible] ed. [illegible] ous [illegible] ases [illegible] one [illegible] that the red cells almost touched without overlapping. A thick film should be spread over an area the size of a sixpence and just so thick that newsprint can be seen through the drop of blood when the slide is lying flat on it.

Dr. E. MCCALLUM (EMS) described 48 cases of BT and 1 case of MT malaria in soldiers back from the Middle East. All were mild and with typical clinical courses. Twelve of the cases gave no history of previous attack while in the malarious area. In the diagnosis of a primary attack [illegible] Treatment was [illegible] and pamaquin, [illegible] three weeks. No toxic effects were encountered. As the hospit[illegible] ous owing to the p[illegible] vivax with suitable [illegible] mmended included [illegible] spraying, and administration of a dose of pamaquin to the patient. No case of indigenous malaria had occurred in the surrounding population.

LABORATORY DIAGNOSIS OF MALARIA

Major J. W. HOWIE, RAMC, said that thin films must really be no more than one cell thick or the stain will not penetrate properly. Thick films are often made too thick; one or two drops of blood are enough—not six or seven as some of the books advise—and the blood should be spread gently and evenly so that the hands of a watch can be seen through the dried specimen. Personally he prefers Leishman's stain for thin films and Field's or Giemsa's for thick. One point is often overlooked: the distilled water must be adjusted to a reaction near neutrality; otherwise malaria pigment and stippling will be missed and species differentiation will be harder. This matters, because prevention of relapses in MT malaria can best be ensured by giving mepacrine, whereas in BT malaria quinine and pamaquin will give better results.

From each case of suspected malaria, a thick and thin film should be made. The thick film is essential when parasites are few; the thin one is needed to determine species. Clinical suspicions should be readily aroused if disasters are to be avoided. Malaria should be suspected in any soldier who has been in an area where the disease occurs. Classical symptoms must not be waited for to make a diagnosis; often the man developing MT infection is aware of no more than a "hangover" that is not caused by alcohol.

It is sometimes mistakenly supposed that blood-films should be taken when the temperature is rising; but the chances of detecting parasites are highest if they are made when the temperature is falling, and absence of pyrexia is by no means a reason for not making a film.

The best practice is to make several films at intervals of 3–4 hours; 5 minutes' examination of four films made at these intervals is far more useful than the prolonged scrutiny of a single film. There should be no [illegible] measures about the interpretation of films. The "? parasites ?" is a confession by the microsc[illegible] needs expert help. A properly stain[illegible] unequivocal red and blue staining in [illegible] parasites. Unless an object in the

Parliament

THE NEW WATER BILL

THE object of the Water Bill introduced on Feb. 2 by the Minister of Health is to make it possible to meet "all reasonable needs for water by householders, industry, and agriculture" speedily and without avoidable waste. It imposes on the Minister, *for the first time*, the duty of promoting the provision of adequate water-supplies and conserving water resources.

The Bill embodies the proposals of the white-paper on a National Water Policy (see *Lancet* 1944, i, 572) which said that the problem "is not one of total resources but of organisation and distribution. . . . There is in this country ample water for all needs." As a preliminary, the Rural Water Supplies and Sewerage Act, 1944, making grants totalling over £15,000,000 available towards the cost of post-war extensions of piped water and sewers in rural areas, was passed last July.

Under the new Bill central responsibility for water policy is to be the function of the Minister of Health. The Central Advisory Water Committee is to be reconstituted as a statutory body and advise not only on matters referred to it but also, on its own initiative, on any question within its ambit. The general framework of existing local organisation is to be retained, but the default and directing powers of the Minister are to be strengthened, and amalgamation of undertakings and joint action are to be encouraged and if necessary enforced. The giving of bulk supplies by one undertaker to another is also to be enforced if need be.

Special steps are to be taken to protect water resources, especially underground water, against misuse, waste, and pollution. In places where special measures for conservation are required, a licence will be necessary before new wells can be made or existing ones enlarged, and water from underground sources must not be allowed to overflow and run to waste. Penalties are provided for pollution of water used for human consumption.

Industry and agriculture are to be given the right to demand water on reasonable terms and conditions, and the present law is to be altered so that the local authority must ensure that mains are, wherever practicable, brought to a point which will enable a house to be connected at a reasonable cost, and must insist that wherever practicable and reasonable, a *piped* supply is brought into the house. At present, the law is satisfied if a supply of wholesome water (e.g., a well) is within a reasonable distance of the house; and if so, even if a water-main runs past the house, there is no need for it to be connected.)

UNRRA'S SCOPE

A statement on UNRRA's powers and responsibilities has been made by Mr. RICHARD LAW, under-secretary for foreign affairs. Under the UNRRA agreement and the resolutions of the UNRRA Council, he said, it can operate only fully and freely after the termination of the military period, and it can operate only in liberated territories at the request of the governments concerned. UNRRA has, however, at the request of the military authorities, and acting as their agents, already sent a relief mission to Greece. This mission has been collaborating with the military relief organisation for some time past and plans are being made for its expansion. It is hoped, moreover, that UNRRA will shortly be enabled to start operations on its own account and on an increasing scale in other Balkan countries. The Greeks, Yugoslavs, Poles, and Czechoslovaks have all expressed a wish to receive UNRRA's help, particularly in the matter of supplies, and plans are being made for the despatch of supplies as soon as shipping and other similar difficulties have been overcome. UNRRA also has in hand a limited programme for relief work in Italy, as provided for by resolution No. 58 of the council at Montreal, and a mission is already in that country making preliminary arrangements. The governments of France, Belgium, Luxembourg, the Netherlands, and Norway have expressed their wish to receive liaison missions, and such missions are already established in Paris and Brussels. These and other governments have also asked UNRRA to undertake, under the control and direction of the authorities, the work of caring for and repatriating displaced nationals in Germany. UNRRA's arrangements for dealing with this problem, as agents of the Anglo-American military authorities, are well advanced, and the training of the necessary personnel has been proceeding for some time.

On the other hand, it is not anticipated that the West European governments will find it necessary to invoke the aid of UNRRA for the actual provision of supplies, which they expect in most cases to be able to procure and pay for themselves.

In this connexion Mr. Law pointed out that UNRRA is not responsible for the importation of supplies into France, Belgium, and Luxembourg. This responsibility lies with the military authorities, and large quantities of relief supplies have in fact been imported by the combined UK-US military authorities during the liberation of these countries.

HM Government are fully alive to the urgent need of bringing relief supplies to the liberated areas and the social and political consequences of failure to satisfy those needs. But I do not think, he added, that the solution of the problems would be facilitated by any attempt at this stage to revise the UNRRA agreement and the council resolutions which constitute UNRRA's terms of reference.

DEPARTMENTAL COMMITTEE ON ARTIFICIAL LIMBS

The MINISTER OF PENSIONS has received from the Departmental Committee on Artificial Limbs the following unanimous recommendations:

(I) The formation at an early date of an experimental department, which in the committee's view would be most suitably located at Roehampton; this department to be under the direction of a wholetime officer of suitable status possessing both medical and technical qualifications.

(II) The appointment of a small standing committee to supervise and develop research and advise on improvements in artificial limbs; this advisory committee, membership of which should not be limited to Ministry of Pensions personnel, to work closely with the proposed experimental department.

The committee further submit that if these recommendations are accepted, a public announcement should be made; they attach importance to giving encouragement to members of the public to send in ideas and suggestions, and consider that it should be one of the functions of the research committee to receive and study such suggestions.

The Minister has accepted these recommendations and has selected for the research post Dr. A. W. J. Craft, who will shortly take up his new duties.

QUESTION TIME

Children's Homes Inquiry

Sir WALDRON SMITHERS asked the Home Secretary whether, in view of the recent disclosures, he would call for a report on conditions prevailing in children's homes under the administration of local authorities; and would he arrange that those who made the inquiries were not members of local authorities and that they would include at least one member of the medical profession.—Mr. H. MORRISON replied: The homes referred to will come within the scope of the committee which is being set up jointly by the Minister of Health, the Minister of Education, and myself. I cannot accept the implication that no member of any local authority can be relied on to form a sound judgment on this matter.—Sir W. SMITHERS: Is the Minister aware that the public conscience is seriously perturbed about recent revelations and the inefficiency of municipally and State-controlled homes?—Mr. MORRISON: My hon. friend should not introduce prejudices of that kind There are plenty of other homes that will have to be investigated.

Mr. G. NICHOLSON: Is the Minister aware that there is growing public anxiety about the whole treatment of orphan children, not only in State and municipal homes, but all round, and will he do his best to allay this anxiety by holding a proper public inquiry?—Mr. MORRISON: That is why the committee is being appointed.—Earl WINTERTON: Will the Minister make it clear that voluntary authorities will also be investigated; and is he aware that many of us, without any political feeling in the matter, are seriously concerned about

e treatment of children in both types of homes ?—Mr
orrison The inquiry will cover all types of homes

London Remand Homes Report

Mr K M Lindsay asked the Home Secretary when he
pects to receive the report of the inquiry into the adminis
ation of remand homes in London —Mr Morrison replied
have now received the report and have arranged for it to be
ublished as a command paper as soon as possible

Discharged while in Hospital

Mr G S Summers asked the Secretary of State for War
at was the practice regarding the discharge from the Army
men in hospital unlikely to be fit for further service, and
ther those so placed would be retained in the Service at
until release from hospital was authorised —Sir James
replied Men discharged in hospital as "ceasing to
requirements" are entitled to 56 days'
hey receive full pay and allow
otice during which period their discharge from Army
ices At the end of this time d in hospital as non-
ervice is confirmed, but they are retai medical treat-
aying patients They continue to r of Pensions hospital
ent but may be re
or in special types
of local authoritie
examined in conjun

Army Order No.

Dr E Summerskill asked the Min er if he was aware
that the operation of this order was ca ng great distress to
soldiers invalided from overseas on a unt of psychosis,
and if he would take action to preve the continuance of
this hardship —Sir James Grigg repl The practice in
these cases has been reviewed and a ne Army order to take
the place of this one will be issued as soo is possible

NHI Dispensin

Mr C A S Manning asked the Mi ter whether he had
considered the action of a firm of che its who were under
agreement with many insurance comm tees in refusing to
supply preparations ordered by insur e practitioners on
the pretext that such preparations e manufactured by
firms of alleged enemy origin and in stituting their own
products, and what action he propos to take with regard
to cases of this nature which had been ught to his notice —
Mr Willink replied I am aware of circumstances, but
I have no jurisdiction in the matter o pt where breaches of
the chemists' terms of service unde he National Health
Insurance Acts are alleged or establis One appeal now
stands referred to me but I am not in a position to give
my decision

Nutrition and Health of Coalminers

Colonel L. Ropner asked the Lord President of the Council
whether arrangements could be made for the Industrial Health
Research Board to carry out an ex ustive survey of the
nutrition and health of British coalm rs in the light of recent
scientific discoveries in those fields — Mr Attlee replied
Clinical and scientific inquiries into th health and nutritional
state of miners have been and wi continue to be made
I am taking up with the various int ested departments the
question whether a more general sur would be helpful and
if so by what agency it could best be conducted

Public Assistance (Amendmen) Order 194 —Mr H
Willink explained that the purpos of this order is to revoke
rticle 92 of the Public Assistance Or ler 1930 which limits the
discretion of local authorities as to the categories of children
who may be boarded out

The Institute of Aeronautical Sciences of the United States
have presented their John Jeffries award for 1944 to Air
Marshal Sir Harold Whittingham director general of the
RAF medical services

Surgical Rubber Gloves —Any doctor in private practice
requiring surgical rubber gloves for professional use should
apply to the secretary of the Central Medical War Committee
BMA House Tavistock Square, London WC1, marking the
envelope 'Gloves' in the top l corner and enclosing
a stamped addressed
a booklet of 6 certific
of 6 pairs during 194

Letters to the Editor

HOSPITAL FOOD

Sir —*Amazing* is the only comment I can make on
Administrator's exaggerated attack on house-officers
(Jan 27, p 130), who, she says, expect and demand a
higher standard of catering than the average patient in
hospital No newly qualified house officer expects the
standards of a first class pre-war hotel, but much could
be done to improve institutional food.
18 hours a
put up

tions for young house-offi
cases is disastrous, and the incidence of pulmonary
tuberculosis in newly qualified men is an alarming feature
of medical practice

The average patient who comes into hospital for a
short spell puts up with bad food, it is hardly worth his

and find bad institutional food no compensation for long
hours and overwork

It is high time the welfare of medical officers received
some consideration, and no amount of argument can
release administrators from their responsibility towards
ameliorating the living conditions and feeding arrange
ments for them

House-officer of Some Experience

ROYAL MEDICAL BENEVOLENT FUND

Sir,—It was w that the
late Sir Thomas his last
Christmas Gifts a is 100th
year, had once again eclipsed all previous records and had
reached the splendid total of £1817

Had his life been spared Sir Thomas would be personally sending this letter of his most grateful thanks to the medical press and thereby to the large number of subscribers up and down the country who by their generosity, have contrived that each year the sum reached has beaten the previous year's record In particular, the gracious donation of one hundred guineas by the Royal College of Physicians to commemorate his entry into his 100th year and to mark the esteem in which his colleagues held him, touched Sir Thomas very much and gave him keen pleasure

On behalf of my committee I tender to one and all our sincerest thanks We shall continue this annual Christmas Gifts appeal as heretofore They have been so generously supported and have evoked so much pleasure and gratitude that, although they will lack the inspiration of Sir Thomas Barlow's personality, we feel they have now become an integral part of our work We are confident that this will be in accordance with the general wish

Arnold Lawson,
Chairman of the Committee
of Management

Royal Medical Benevolent
Fund
1, Balliol House, Manor Fields
London SW15

A FACULTY OF OPHTHALMOLOGISTS

Sir —The statement by the Council of British Ophthalmologists (CBO) summarised in your last issue does not mention that for the past year the Council has been discussing the proposed Faculty with the Association of British Ophthalmologists (ABO)—an actively functioning, democratically constituted, body which includes nearly half the full time practising ophthalmologists in the country and is also open to part time ophthalmic practitioners of experience I write this letter as a private individual but I was president of the ABO when the negotiations started, and know why they broke down

The CBO, composed of some 15–20 senior consultants, mainly in the London area, has had a purely nominal existence unknown to the mass of ophthalmologists, and has been almost moribund for the past decade at least The average age of its members must be between 60 and 65, all in an assured position, and they held aloof from any inter[illegible] until the ABO passed a [illegible]ting in 1943 to initiate a movement to found a College or Faculty or similar Institute of Ophthalmology.

It would seem that the CBO was then suddenly stimulated into active interest. The council of the ABO welcomed this interest in the hope that its origin was disinterested, but it transpires that the CBO's intention was, and is, to take control of the movement and direct its future course. The constitution proposed by the CBO included a non-elected senior directorate or "upper house." It was also suggested that the constitution was not to be subject to alteration by any future majority vote of the constituent members. The ABO gave way on various matters, but insisted that the constitution of the proposed Faculty must be entirely democratic; that election to the Faculty council must be by vote; that a majority postal vote of members must be binding on all matters; and that the proposed constitution must be subject to alteration annually in the same democratic fashion. It refused to give way on this point: hence the final failure of negotiations.

Under the constitution now proposed by the CBO only a small proportion of ophthalmologists will be eligible for election as members of the Faculty: generally speaking, they must have charge of beds in hospitals approved by the CBO, and "provisionally, these will be general hospitals of more than 200 beds and special ophthalmic hospitals of more than 20 beds." Other ophthalmic surgeons of consultant rank "approved by the CBO" will also be eligible. Of the 21 members of the future Council of British Ophthalmologists, which will be executive of the new Faculty, 15 will be elected by this small and select constituency.

The Faculty has been registered by the CBO already, and this step was taken during an interval between negotiations without the knowledge or approval of the ABO, at a time when the ABO had been requested not to take any official steps which might in any way upset the mutually desired successful conclusion of the negotiation.

London, W1. LIONEL M. GREEN.

PNEUMOCOCCAL LOBAR PNEUMONIA

SIR,—The paper by Ramsay et al. in your issue of Jan. 20 confirms the efficacy of sulphamezathine in the treatment of pneumococcal lobar pneumonia. The resul[illegible]ly justify it as the drug of choice. In 1[illegible] in Glasgow 441 cases of typed pneumococcus lobar pneumonia with sulphapyridine. There were 38 deaths; excluding 8 patients who died within 24 hours of admission to hospital the fatality-rate was 7·0%. Although the newer chemotherapeutic agents such as sulphadiazine and sulphamezathine are admittedly less toxic, they are no more effective than sulphapyridine.. Sulphadiazine is probably the one of choice; I have seen severe leucopenia develop soon after administration of sulphamezathine.

In spite of chemotherapy, failures in the treatment of pneumococcal lobar pneumonia are inevitable. The results of chemotherapy combined with serum or vaccine therapy are no better than those of chemotherapy alone.[1] I wondered whether the results could be improved by [illegible]tensive course of chemotherapy; but [illegible] I recorded in your last issue show that [illegible]ponse cannot be correlated with the concentration of the drug in the blood. Hence I do not believe that the fatality-rate could be lowered by giving larger doses.

In their analysis of fatal cases Ramsay et al. mention 5 patients who died and who had low blood-levels of sulphamezathine. Unfortunately only one case is analysed in detail—that of a man aged 57, with a type V infection, admitted on the 10th day of illness. They later refer to 9 patients—all with adequate, and 3 with high blood-levels—in whom death was attributed to toxæmia; 3 of these were treated before the 7th day of illness. It is obvious that deaths can occur in the presence of a high blood-level; are Ramsay et al. justified in assuming that the deaths of the first 5 patients were due to the low blood-level of sulphamezathine?

It is clearly established that in the aged the sulphonamides are not nearly so effective as earlier in life; in th aged pneumonia is likely to be a severe disease. Mor over many patients are admitted to hospital when th disease is already well established. If we are to reduc the fatality-rate the diagnosis must be made earlier in the illness. More reliance might be placed on the histo and early physical signs, and treatment should b before the classical signs of dullness on percussion an tubular breathing are well established.

Royal Northern Infirmary,
Inverness.
ARCHIBALD DICK.

EXUDATIVE TONSILLITIS

SIR,—Judging by his letter of Dec. 30, Dr. Alc cannot have read Neubauer's paper (*Lancet*, 1943, ii, 1 In my experience diphtheria in an immunised p is a very definite entity. The condition [illegible] tonsillitis closely, but may include any of the clas signs—fœtor, adenitis, œdema, myocarditis [illegible] —and a new one, circumoral [illegible]. Naturally after immunisation these are [illegible] obvious as in ordinary diphtheria. In the [illegible]unised patient the membrane is very like that [illegible] tonsillitis; it is easily stripped without bleeding, [illegible]curs and is resistant to sulphonamides. To say [illegible]membrane alone is the essential and diagnostic les[illegible] a very big statement.

Machynlleth, Montg[illegible]shire. RONNIE CLARKE.

Rh ANT[illegible]Y IN BREAST MILK

SIR,—In your le[illegible]of Nov. 4, 1944, A Year's Work on the Rh Factor, the [illegible]ment is made that breast-feeding is [illegible] affected with hæmolytic disea[illegible] of the risk of continued hæmolysis of the [illegible]'s red cells from Rh antibodies ingested with the [illegible] milk; you recommend that the breast milk should [illegible]rawn off and boiled before use. To deny the baby [illegible]breast without good reason is such a major cat[illegible]phe that one is tempted to ask what evidence the[illegible]s that Rh antibodies from the mother's milk can [illegible]ch the baby's blood-stream in sufficient titre to da[illegible]ge the red cells. And, in view of your statement, I [illegible]ribe below the findings in a case which I have recen[illegible] investigated which indicate that the hæmolytic proc[illegible]continues quite apart from breast-feeding.

Clinical jaundice de[illegible]oped in a baby (blood-group A, Rh-positive) on the third [illegible] after birth. Investigation reveale that its mother was [illegible]up A; Rh-negative, and that an R antibody, active to a [illegible]tre of 4–8 against the baby's cells was demonstrable in the mother's serum. The jaundic rapidly cleared, but [illegible]e baby became increasingly anæmic and when 12 days ol[illegible] its hæmoglobin wa[illegible] Despite the transfusi[illegible] of 100 c.cm. of Rh-negative bloo compatible with the [illegible]ther's serum, the hæmolytic progres continued, and after a[illegible]urther 11 days the baby's hæmoglobi had dropped to 50% [illegible]nd its red cells totalled 2,400,000 pe c.mm. A differentia[illegible]agglutination count showed tha approximately 1,300,00[illegible] of these cells were transfused cell so that had no transfus[illegible]n been given the baby's hæmoglobi level would have been i[illegible] the region of 22%. After a furth transfusion of Rh-negat[illegible]ve blood, the baby made an uneven ful recovery.

This case was thus a [illegible]ypical example of the progressi type of anæmia asso[illegible]ted with hæmolytic disease the newborn, but the [illegible]ost significant finding was th the baby had not been put to the breast after the seco day as the mother had developed a serosanguinous di charge from both nipples. During the time when t hæmolytic process was proceeding steadily it was bei fed on a boiled cow's-milk mixture. Hence, the was no possibility in this instance that the ingestion Rh antibodies was responsible for the continuance of t hæmolytic process.

Army Blood Transfusion
Service.
GEOFFREY H. TOVEY.

⁂ Rh antibodies were first demonstrated in brea milk by E. Witebsky, G. W. Anderson, and A. Hei (*Proc. Soc. exp. Biol., NY*, 1942, 49, 179. 1943, 52, 28 The titre is usually low, and there is no direct evide that breast-feeding in these cases causes continued hæm lysis of the baby's cells, but E. Nickerson and R. Moulton (*New Engl. J. Med.* 1943, 229, 863) noticed t even apparently unaffected infants nursed by sensiti mothers did not do so well as expected.—ED. L.

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[1] Dick, A. *Lancet*, 1944, i, 561; Plummer, N., Liebmann, J., Solomon, S. Kammerer, W. H., Kulkstein, M., Ensworth, H. K. *J. Amer. med. Ass.* 1941, 116, 2366.

RADIO-FREQUENCY CURRENTS IN TUMOUR TREATMENT

SIR,—During our work on radio valves, one process called "EOH" or "eddy current heating" gave us an idea which might be applied to medicine. This process [illegible] radio-frequency currents through [illegible] (but do not touch) the valve being [illegible] the metal parts of the valve glow [illegible] currents induced in them. When [illegible] any gases present in the metals are released and mostly drawn off by vacuum pumps; a little gas may however remain and therefore a second operation known as "gettering" is performed. A small metal pellet containing barium is placed inside the valve. [illegible] ough [illegible] d to [illegible] the [illegible] ises. [illegible] tille [illegible] to a [illegible] until it [illegible] the seat of the trouble, when point electrodes [illegible] coils could be brought near and the patient "get[illegible]ered." This might enable deep-seated cancers or suchlike to be destroyed when a knife could not reach them, and save the patient the fear of an operation or anæsthesia.

Baldock, Herts.

G. ANDREW FORSYTHE.
H. MCCORMICK.

STOMATOLOGY OR DENTISTRY?

SIR,—Mr. Bowdler Henry says that "morally it is not [illegible] nt to lose teeth should [illegible] stitutes. Ethically it [illegible] that a dental surgeon [illegible] ds over the counter." [illegible] nt will Mr. Bowdler [illegible] in of sincerity assure [illegible] of artificial substitutes" has been entirely given up in his private practice?

Queen Anne Street, W1.

W. PEEBLES.

On Active Service

CASUALTIES

KILLED

Martin Patrick Conroy, MB NUI, IMS
Ravenhill Sweeting, MRCS, RAMC

WOUNDED

Captain S. D. Stock, OBE, MB LOND., RAMC

AWARDS

GC

The late Captain Jenkin Robert Oswald Thompson, RCS

This award is for conspicuous gallantry and devotion to duty aboard hospital ships since the start of the war, notably on the [illegible]ores at Dunkirk in May, 1940, and on the *St David* at Sicily, Salerno, and Anzio, when in each instance, in spite of repeated [illegible]ive bombing attacks and [illegible]

[illegible] H. L. G[illegible]r, OBE, [illegible], MRCS, RAMC (R of O)
Brigadier A. F. [illegible]allace, OBE, MCh OXFD, RAMC
Brigadier Q. V. B[illegible], OBE, MC, MB DUBL., RAMC

DSO

Colonel H. M. E[illegible] RCAMC

OBE

Colonel R. D. Ca[illegible]s, MC, MB EDIN., RAMC
Lieut.-Colonel E[illegible]fford, MRCS, RAMC
Colonel W. M. E[illegible]c, MB LOND., RAMC
Colonel C. D. Go[illegible] RAMC
Colonel Cyril H[illegible]so, MC, MRCS, RAMC (R of O)
Lieut.-Colonel I[illegible] Keating, MB DUBL., RAMC

Lieut.-Colonel S. C. H. Lane, MB LOND., RAMC
Lieut Colonel J. P. Laplante, RCAMC
Colonel C. B. Leech, RCAMC
Lieut.-Colonel Alastair MacLennan, MB ABERD., RAMC
Lieut.-Colonel P. R. Mitchell, MB ABERD., RAMC
Lieut.-Colonel J. A. Noble, RCAMC
Lieut.-Colonel I. A. M. Paton, MB EDIN., RAMC
Colonel C. S. Thompson, RCAMC
Colonel K. A. M. Tomory, MB EDIN., RAMC

BAR TO MC

Captain F. W. Hayter, RCAMC

MC

Captain H. [illegible]
Captain P. [illegible]
Captain W. [illegible] RAMC
Captain J. Johnston, RAMC
Captain J. M. Murphy, RAMC

MEMOIRS

Captain PAUL ADLER, who was killed in action in Burma last November, was the son of Mr. James Adler of Hamilton Terrace, London, NW8. He was educated at Bradfield College and Christ's College, [illegible] immediately after he qualifie[illegible] rmy [illegible] autumn of 1939. During [illegible] the [illegible]ance train in France, and he later served with various units in England before he was sent abroad, at first to East Africa and later to Burma. He was 29 years of age and leaves a widow. J. R. B. writes: "I knew Paul Adler well at the London, where we often worked together in the library and museum, and I spent many weekends with him on his boat, at his home, and in the country. He was a grand companion at all times, who put all his energies and inter[illegible] he [illegible] His [illegible] dot [illegible] places he visited."

Captain MICHAEL MULLINS, SAMC, who died on Dec. 26 of pneumonia while on active service in Italy, came to this country two years before the outbreak of war to study at Trinity College, Oxford. In 1939 he began his clinical work at Guy's where, like his father and his uncle, he captained the rugby team. The year of his captaincy, 1941–42, was one of Guy's most successful seasons and much of it was due to his leadership on the field. Playing as a wing-forward he was fast on the ball, running like a three-quarter with a most disconcerting side-step, and a master at "selling the dummy." But he was a good scholar [illegible] work was [illegible] His record at hospital was [illegible] conscientiousness, and sympathetic interest in the welfare of his patients. "But above all," writes S. M. C., "Mike will be remembered for his human-heartedness, his affection for his fellow men, and his infectious jovial outlook on life." After he qualified in 1942 he held house-appointments in the Guy's sector-hospital at Pembury, but he hankered to return to South Africa to serve with his own countrymen, and early in 1943 he sailed for home with his newly married wife, a Guy's staff nurse, whom he leaves with a small daughter. He was 28 years of age.

US MEDICAL HISTORY OF THE WAR.—Colonel Albert G. Love, historian of the US Army Medical Department, states that plans have been made to complete the medical history of the war six months after victory in the Pacific. Administrative aspects of the medical service—including supply, personnel, training, and hospital construction—will be recorded by a number of officers commissioned in the Medical Administrative Corps, most of whom are university graduates in history and half of whom are now serving overseas. The medical aspects will be dealt with by medical officers especially qualified in various specialties. Twenty-three years were required to complete the medical history of the American Civil War, and ten years to complete that of World War I. Early publication of the current history is thought desirable because many of the advances in military medicine will be applicable in planning for national defence and in civilian practice.

Obituary

THOMAS HARRISON BUTLER

D M OXFD, F R C S

Harrison Butler was born in 1871, the son of a clergyman. He was educated at St. Paul's, Dorchester grammar school, and Oxford, where he secured first-class honours in natural sciences. He qualified from St. Bartholomew's Hospital in 1895, and after he had held one or two house-appointments the Radcliffe travelling fellowship gave him the opportunity of several years' study abroad. He worked at Kiel, Berlin, Dresden, Vienna, and Paris, and for a time was plague medical officer at Durban and harbour doctor at Port Elizabeth. A thesis on plague gave him his doctorate at Oxford in 1902, and in the four years following he was assistant surgeon to the St. John Ophthalmic Hospital at Jerusalem where he gained a wide experience of eyes. Returning to this country he settled in ophthalmological practice in Coventry and Leamington and became ophthalmic surgeon to the Coventry and Warwickshire Hospital; in 1913 he was elected to the staff of the Birmingham and Midland Eye Hospital. His connexion with these two cities lasted over 40 years, during which his reputation grew, not only in the Midlands, but throughout the country. When he had finally attained the leisure to which a long life of hard work had entitled him, he returned to hospital work in Birmingham for more than five years of this war, to assist a depleted staff by replacing his younger son who was called to the Forces.

"He will remain in the memory of English ophthalmologists," writes P. J. E. "as a human personality; and those of us who worked with him have a sense of lost affection. He was universally welcomed for his forthright honesty and his desire to encourage the younger generation, with whom he spared no pains. He was intensely happy in his work and derived from it a humane satisfaction, for he enjoyed the society of his fellow men. His services to the unity of Midland ophthalmology cannot be easily estimated, but in attaining the position of acknowledged leader he symbolised the best and held a paternal sway."

His activities in the social side of ophthalmology absorbed much time and energy; but the energy was always abundant. He came to occupy the high places and did so naturally and with good humour. He was at various times president of the Ophthalmological Society of the United Kingdom, of the ophthalmic section of the Royal Society of Medicine, of the ophthalmic section of the British Medical Association, of the Birmingham branch of the BMA, and of the Midland Ophthalmological Society. An enthusiastic member of the Oxford Ophthalmological Congress, he was an active member of council for many years and was always ready with help, advice, and hospitality: in 1924 he received the Doyne memorial medal. He was also a foundation member of the Midland Ophthalmological Society, its president from 1919 to 1921, and its untiring secretary for 28 years. The final and appropriate honour bestowed upon him was his election in 1941 to the honorary fellowship of the Royal College of Surgeons, which set the seal on his pre-eminence and worthily marked the appreciation of his work.

His writings were numerous though mostly short. He was the first to write an English book on the slit-lamp, and his opinion on the use of this instrument was eagerly sought. He always provided his own illustrations for his articles, for he was an able artist. While he was affectionately known by all connected with ophthalmology in this country, he was even more widely known in his capacity as a yacht designer. Some idea of his vitality is given by the fact that he contrived, in his little spare time, to achieve an international reputation in the design of small cruising yachts: in this sphere too, and as a leading member of the Corinthian Yacht Club, he became an acknowledged authority, and from this hobby he derived the same simple pleasure which a generous nature afforded him in his professional work.

"His work was characterised by the utmost care and skill," writes C. R. "Every new method was considered and tried by him—new instruments were examined and tested, and if he considered them of value were brought into daily use. His early work on the slit-lamp is a example of this. He was always ready to instruct, hel and encourage his house-surgeons and juniors, and man ophthalmic surgeons, both in this country and abr owe him a debt of gratitude. He had a great love mankind and this showed itself in his treatment of patients: he was always available to them in the troubles and they held him in the highest esteem. spoke his mind fearlessly but was never unkind. held firmly to his opinions but, if proved wrong, was t first to admit a mistake and to give credit where it w due. To the end of his career he retained a youthf energy and enthusiasm which is rarely seen."

Mr. Harrison Butler died on Jan. 29. His wife, t daughter of Dr. W. H. Reed, survives him with two both of whom are doctors serving with the Forces. younger son has succeeded him as house-surgeon to t Birmingham and Midland Eye Hospital, where t family tradition thus continues.

HERBERT SMALLEY

KT, M D DURH.

ON Jan. 25 Sir Herbert Smalley died at Hove, aged He worked in the prison medical service from 1876 1914, and was HM Commissioner of Prisons for further years.

His father was the Rev. Cornwall Smalley and was born in London. He went to St. Paul's School a thence to King's College, London, of which he lat became an associate. Qualifying as MRCS in 187 he was appointed assistant surgeon to Chatham in the following year, and served successively in prisons at Millbank, Dartmoor, Pentonville, Dover, Parkhurst. In 1890 he was promoted to be a inspector of prisons, a post for which he was well fitt by his practical experience. As an inspector he did best to raise the status of prison medical officers, to put the medical care of prisoners on a scie foundation. Especially he was concerned with the ditions in prison hospitals, and in 1902 he produced useful book on *Prison Hospital Nursing*. He evidence before the Royal Commission on the Care Control of the Feebleminded (1904), and his con *tions to the annual reports of the Prison Commissione* showed a consistent endeavour to reconcile the efficie conduct of prisons with humanity towards thei The knighthood bestowed on him in 1913 showed his conscientious labours were appreciated official but he was also respected and liked by his associates the service, and particularly by the prison officers. "We admired," writes one of them, "his experience, sincerity, integrity, and friendliness, his unshakable firmness of purpose. He realised where medical and administration points of view into opposition a degree of compromise was advisa so long as principles were not involved. But he a strong man at the Board of Commissioners, able take into consideration other points of view besides own."

He married in 1885 a daughter of G. F. Gramman, *they had no children.*

HAROLD COLLINSON

CB, CMG. DSO. M S LOND., F R C S

WE recorded last week the death o Jan. Collinson, the well-known Leeds surge . He years of age and had been ill for some ime.

The son of a wool merchant. Har Collinson born in Halifax and educated at Ackwo h and Boo schools, whence he became a stude at the L Medical School of the Yorkshire College then part of Victoria University), and ultimately at the Ge Infirmary. He had a brilliant acad nic and career in what were perhaps the great t days of surgery. Going through the usual a pointments precede election to the staff, he becam ssistant su in 1907 and surgeon some 11 years la er. In the versity of Leeds he was clinical lect er, professor clinical surgery (1927–33), professor of urgery (1933– and dean of the medical faculty (193 41).

From 1905 onwards he trained hims for war se and in 1914 he was mobilised with s unit, the West Riding Field Ambulance. Go to France the following year he became ADMS the 62nd (We

Riding) Division, and was later promoted to colonel. He put all his energy into his war service and was appointed DSO in 1916, CMG in 1918, CB in 1919, and [illegible] the Legion of Honour.

[illegible] present war he was group officer and [illegible] in surgery under the Emergency Medical [illegible] n 2. Until 1941 he was also dean of the [illegible] school, and throughout his career he was [illegible] ted with the students—first as a teacher [illegible] d later as an adviser. In both capacities he won their [illegible] fection and respect, and he was a great favourite with [illegible] em.

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He never
efu.
made up
is mind it was
as somewhat
rive; he was
enerously fro:
ut fairly, and was not afraid to give high credit to [illegible] thers when he thought it due; and in all his contacts
mest. In his recrea-
iis work; he was at
and almost reckless
[illegible] the hunting field; he was a lusty trier at golf and [illegible] ter an ardent angler. He was a man trusted by every-[illegible] ne—genial, kindly, and manly."

Mr. Collinson leaves a widow, a son who is a member of the medical profession, and two daughters.

DAVID LIVINGSTON HAMILTON

FRCSE

Dr. Hamilton died at Cambridge on Jan. 27, within a few days of his 81st birthday. He was born at Armagh and was educated at Ledwick School and Carmichael College, Dublin, and at Owens College, Manchester. He took the Scottish triple qualification in 1887 and the licence of the Coombe
and in 1895 he obtained
College of Surgeons. He
Southern Hospital, Ma
years he was in practice at G.
later at Dover, where he rem
1911, when he bought the pr
he worked till within a few d
fare to keep up with the ad
and everywhere his kindness
of his patients.

A keen Volunteer and Territorial, during the last war he commanded the 82nd field ambulance in France, with the rank of lieut.-colonel, and was later appointed DADMS to the 1st Army in England. Another of his interests was the St. John Ambulance Brigade and in 1931 he was appointed a serving brother.

Dr. Hamilton's first wife, Miss Helen Bagge, died in 1903, and in 1922 he married Miss Gertrude Marshall who survives him. He had three sons, now all serving in the Forces, and two daughters.

ARTHUR THOMAS WILKINSON

M D LOND., B SC VICT., F R C P

By the death of Dr. A. T. Wilkinson on Jan. 21, Manchester loses the last of its three distinguished nonagenarian physicians. The other two were Graham [illegible] on Bury.
[illegible] in 1876, having previously collected [illegible] in arts and
[illegible] honours by t
[illegible] of the Manc
[illegible] ician there, and for nine years assistant [illegible] He was especially interested in renal [illegible] he wrote usefully in this journal and [illegible] president of the Clinical and Patho-[illegible] e took a full part in the professional [illegible] r. But his main contribution was [illegible] n his earliest medical days he was a [illegible] en himself up for examinations in [illegible] d collect round him fellow students [illegible] et, and by question and answer he [illegible] al and good advice. A correspondent [illegible] Guardian points out that there was [illegible] he never pushed through; but [illegible] an unwilling learner.
Thomps

Wilkinson's teaching was practical both in diagnosis and treatment; he had a retentive memory, and with experience of general practice and hospital work he was able to give many useful hints, especially in the use of drugs. At the Royal Infirmary he acted for many years as dean, giving sound advice to the students who came his way. Both during his medical career and when he had retired from practice he spent much of his time in evangelical work, for he was a keen and able Methodist preacher and worker; and throughout his life he [illegible] medical aid to
those
deavour. His
chief
This he did
very cleverly, adding much interest to lectures which he and others gave on travel. To the end he retained all his faculties; and his letters, both in their characteristically clear writing and in their composition, were a delight to his friends. He came of a long-lived family, for quite recently there were six of his generation alive, with an average of over 80 years. His son is Dr. A. G. Wilkinson of Egham.

EDWIN ARTHUR PETERS

M D CAMB., F R C S

It is now more than ten years since Mr. E. A. Peters left the active staff of University College Hospital, the Bolingbroke Hospital, and Paddington Green Children's Hospital, where he was surgeon to the ear, nose, and throat departments. He died at his home at Netley Abbey in Hampshire on Jan. 29 at the age of 76.

He was the son of Edwin Peters, and was educated at Charterhouse, and at Caius College, Cambridge. Taking a first-class in the natural sciences tripos, he went to Guy's, where he was awarded the gold medal for diagnosis. He qualified in 1894, and after postgraduate study at Heidelberg, and house-appointments at Guy's and elsewhere, he was elected to the staff of the Royal Ear Hospital. There he quickly won a reputation as a sound aurist not given to rash judgments. A careful operator, he was keenly interested in his craft and did much to modify and perfect the technique of aural operat
mastoid. When
the Ro
niversity College
Hospit
sound common
sense were valuable assets to the new department. "Peters and the other member
writes G. S. H., "worked hard
equipping the new department
point in our many discussions,
troubled waters when arguments became heated, and he was beloved of us all." Exceptionally well read, and a brilliant conversationalist, it was difficult to find a subject with which he was not acquainted.

When Peters was elected president of the section of otology of the Royal Society of Medicine in 1934 he chose as "
of the eusta-
chian tul
ils and Naso-
pharynge
s continuing
interest
of the throat
to general disease. He
Lake in the preparatio
Handbook of Diseases of
war he served in the R
Victoria Hospital, Netle [illegible] the late Sir Arthur Hurst in 1917 he contributed to our columns a provocative article on the treatment of hysterical deafness by "pseudo-operation."

Mr. Peters married Miss M. R. A. Mains and they had one son and three daughters, one of whom is now medical officer in an Ordnance factory.

THE LATE MR. JOLL

A colleague writes: The surgeon visiting London invariably went to watch Joll operate, for the technical beauty of his operating was well known, particularly to American and Dominion surgeons. If the sign of the expert is that he makes difficult jobs look simple, Joll was the most expert of operators. To him the operation seemed utterly effortless. He brought the same sureness of touch to his knife as the master brings to his brush.
persona
not one

Joll rightly believed that the knife was the least traumatic of surgical weapons. "It all depends on getting into the right layer," he often pointed out as he was doing the goitre. He never divided the pretracheal muscles of the neck, and if asked would say, "divide them in your first 200 cases, after that you won't find it necessary"—and he was well over the 7000 mark. For an afternoon's operating, four goitres would form a minor part of his operating slate—20 minutes was an average time for a case. There never was any appearance of hurry, or rush, nothing slip-shod. He saved a little time by diathermising the superficial vessels. For dissection he used a blunt dissecting forceps rather than scissors, but primarily he defined everything with the point of his knife. Any small oozing vein on the gland he would cover with a small swab, maintain pressure, and continue operating. He used a needle-holder for sewing most layers, but within the abdomen he sewed by hand, with a curved needle, and he stitched his anastomotic layers neatly and very closely. He never seemed ruffled or ill-tempered with his assistants. But such cooperation came only from courteous training. His team were well drilled and had been taught how to give him ample exposure; the artery forceps had to be slapped into his hands. He never used a multitude of assistants, and except for the goitre operation (in which he had a few addenda) fancied no special instruments.

Joll was a natural operator, as a man may be born a natural cricketer. He had the eye, the "timing" to grasp with precision the bleeding deep vessel; he changed the "stance" of his hands as rapidly and as often as does the cricketer to meet the new demand. Even his feet were not lumps of standing clay as he operated, and he would move naturally to get into the most accessible position; thus he would edge his way to the patient's head as he took the vessels to the right lobe of the gland. He kept his large hands agile by constantly operating and he used them with grace—none of the gesticulations of the "showing-off" surgeon. But Joll enjoyed being watched; he was never "stage-struck" and could speed through the lists in spite of a large audience. He has been known to do a partial gastrectomy in 20 minutes, and on one occasion, while the patient was being turned from the abdominal to the perineal position in the course of an abdominoperineal operation, he went into the adjacent theatre and had completed an appendicectomy and returned by the time the patient was in the perineal position. Of course, he spared himself by getting his RSO to sew up for him, and he would work two tables. His outlook on life too saved him, for he was not given to brooding after operations, and he had a capacity for concentrating intensely and dismissing the operation from his mind once he left the table. He relaxed fully when his work was done, and would sit with limbs sprawling, utterly free in mind.

His surgical courage was great, and the cancer patient particularly could feel assured that the surgery would be heroic, and hope would not easily be abandoned. With the same courage he met the news that his days were numbered with a bon mot on his lips. He was not going to rest his bones on cushions. He went on operating, and ably too, until a fortnight before his death. He would have his deep X-ray therapy and then go to the theatre. He attended RSM meetings, and a week before his death he was revising a new edition of his goitre book, carefully checking every reference himself. To his many friends who called on him he never bemoaned his fate.

Beyond the circle of his colleagues it will be for his goitre work that he will be most widely remembered. Others may have made the patient safe for the goitre operation, but Joll helped towards making this once formidable operation safe for the patient.

National Association for the Prevention of Tuberculosis.—The association is holding a refresher course at Manchester from April 23 to 28, and at Hairmyres Colony, Lanarkshire, from June 26 to 28. Further particulars from Dr. Harley Williams, Tavistock House North, London, WC1.

Dr. R. A. Young, has been elected vice-chairman of the association in the place of Sir Percival Horton-Smith-Hartley, who has retired.

Notes and News

INSTITUTE OF CHILD HEALTH IN LONDON

The Hospital for Sick Children, Great Ormond Street, the British Postgraduate Medical School, Hammersmith, collaborated and produced a scheme under which it is hoped to found a chair in child health at the University of London. The scheme cannot be fully developed until after the war; but it is felt that, by establishing an Institute of Child Health forthwith, a useful start could be made. It is proposed that this shall be set up jointly at the two hospitals. When the department of child health is developed, two readers will be appointed to work under the professor, one at Hammersmith and one at Great Ormond Street. A report presented to the London County Council on Tuesday speaks of the value of an institute in training specialists in pædiatrics, and general practitioners, clinic officers, and medical, nursing, and social workers, and the importance of research with a view to the reduction of neonatal mortality. Such research can only be undertaken in a large obstetric unit.

The maternity unit at Hammersmith Hospital provides 71 cots and includes two well-equipped rooms, usually containing 6 to 8 premature babies born in the hospital. Its use will meet immediate needs, but it will be necessary later to provide a special unit where premature babies born at home (or at small hospitals or nursing-homes with inadequate accommodation) can be received with their mothers as early as possible after the confinements. With such a unit there would be approximately 60 normal infants and 20 premature infants under care.

The trustees of the Nuffield Foundation have allocated £10,000 a year for ten years for the endowment of a chair, and it is hoped that the salaries of the readers will be found from academic or other sources. The site, buildings, and staffing of the institute will require a large sum, and this may have to be raised by a public appeal which the chairman of the Hospital for Sick Children would sponsor. The hospitals committee of the LCC has recommended that the proposal to set up an institute should be welcomed and that existing facilities at Hammersmith Hospital should be made available immediately.

REABLEMENT

More than 250 hospitals in England and Wales are now using rehabilitation methods—including physiotherapy, remedial exercises, outdoor games, and handicraft. This is nearly twice as many as a year ago when the Ministry of Health appealed to civilian hospitals to start this work as soon as possible. Some hospitals are using local halls, others have been supplied with prefabricated huts and equipment by the Ministry. Most of the 400 hospitals covered by a recent Ministry survey had appointed a member of their medical staff as rehabilitation officer, and many of these have attended special courses. When convalescence is ended the Ministry of Labour and National Service is ready to help the patient to find suitable employment or to attend a vocational training centre. Large firms in the neighbourhood of certain hospitals have also set up workshops in which disabled employees may begin their return to industrial with suitably adapted work under proper supervision.

The Minister of Health has now turned to the Minister of Education for help in providing educational courses for civilian patients who are likely to spend long periods in hospitals or sanatoriums (MoH circular 5/45). Subject to medical approval, a patient will be put in touc
education authority who will arrange correspo
visits from tutors, and the loan of textbooks f
scholars. Service patients are covered by
correspondence course scheme, but if they re
after invaliding they will become eligible
offered by the local education authority.

FOR THOSE WHO HAVE MA

The Marriage Guidance Council, with
London and Lord Horder as presidents, t
Gray as chairman, and Mr. David Mace, p
are interested in the survival of family life
well-ordered society. The Council has at p
in London and hopes to open others in th
London centre is at 78, Duke Street, W1, w
advice may come by appointment to di
marriage and parenthood, and to receiv
logical, and legal help. This centre has b

two … of 1000 cases. Advice
is al … courses of lectures and
conf … a training school and
conference were held at Jordans. It is not suggested that a week's course will by itself provide sufficient qualification for
marriage …

… the purpose of the course is to
help to fill possible gaps in their knowledge and to aim at an agreed policy about the way in which certain problems are to be treated."

NOURISHMENT AT SCHOOL

SCHOOL meals and milk are not yet being taken by all the children for whom they are available; and the rise in numbers is subject to fluctuation. A falling off last year, temporary it is hoped, is recorded in a report presented to the education committee of the London County Council. The number of
children rece
1944, … ober,
102,9 … was
dinne … had
… the proportion of children having meals and milk to the total numbers attending school that day were compared with the corresponding proportions on a day in the previous June, with the following results:

School	Meals		Milk	
	October	June	October	June
Elementary ..	28·10%	33 63%	70 80%	72 59%
Secondary ..	68 81%	65 27%	61·71%	61 96%

Thus there was a slight fall in the proportion of children having milk and a more pronounced fall in the proportion taking school dinners. Since that time there has been a fairly steady rise, and by Nov. 24 the percentage of elementary-school children taking dinners had risen to 31·5. It would be instructive to know the causes of the temporary decline.

During the autumn holiday, Oct. 23–30, 50,769 dinners were provided in 224 centres, as compared with 23,207 dinners in 155 centres during the summer holiday of 1944 when rest centres were not available for the serving of meals.

CHAIR OF PSYCHIATRY AT THE MAUDSLEY HOSPITAL

Two university chairs are tenable at the Maudsley Hospital; but there has been no professor of psychiatry since Dr. Edward Mapother's death in 1940, and Prof. S. A. Nevin, who has held the chair of pathology since 1939, is at present on war service. A report presented to the London County Council last Tuesday refers to the Goodenough Committee's opinion that action must be taken to build up a supply of
teachers of ps

… chair in psychiatry. No salary is paid to
the professors by the University of London, and the chair of psychiatry was formerly held by the medical superintendent of the Maudsley Hospital, who received from the LCC £1150 for part time service.

The Goodenough Committee favoured whole-time salaried
employ … f professors, and it is accordingly proposed that
the … ough … secondly of the chair with the post of medical super-
One patie l be discontinued, and that a new post of
and the w … fical psychiatry shall be created. The new
eventually. intment, which is to be conditional on con-
wound of th tment to the university chair, will date from
suspected … nd his salary will be £2000 with a war time
taining bile … 0 By arrangement, he will have facilities for
consequence search in any of the hospitals and institutions
treatment
soundly, but

TALENTS UNEARTHED

and the oth … last month the British Postgraduate Medical
One soldie … mmersmith Hospital held an art exhibition,
well as the … butions from the administrative, medical,
which require … and domestic staffs.
others had ble … ction devoted to painting the styles varied
and needed d … representational to the decorative, the
… realist.
… on Dr. Charles Newman's amazing
Bath Pipes, though they were scarcely realistic in the usual sense. Dr. Meave Kenny's self-portrait was treated realistically. The work of Dr. E. G L Bywaters ranged from a
straightfor
… ual study of an aero-
… elaborate drawing of a
… o attractive decorative
panels, a study of Outpatients, and an amusing attempt to translate the subjective effects of 'Pentothal.' Mr. R. H. Franklin exhibited an attractive oil, View from a Window. Prof G. Grey Turner brought out some sketches from a notebook of 1899 which induced regret that the sketch-book habit is no longer in vogue. Dr. E. J. E Topham showed some pleasing pencil studies of heads and Dr. A Preiss a tragic one of a Burned Airman in water-colour. Mr. M. V. Jay was successful in water colour and pencil drawings of children, and Nurse H Smallman contributed several good pictures, of which the best was a 15-minute sketch of a child

Other sections included exhibits of toys, model ships, dolls' furniture of "Perspex" plastic, rugs, book-binding, and embroidery. Among the bound books were two lovely examples by Dr. R. Turner.

The exhibition, which was opened by Sir Thomas Carey
Evans, medical supe…
keen interest.
its success wil … emulation elsewhere.

University of Oxford

On Jan. 25 the following degrees were conferred:

DM.—*W. A. Young.

BM, B Ch.—N. D. Ashe, *A. G. Beckett, *B. A. Ellenberg, M. J. T. Hewetson, *M. R. Williams, *J. T. Wright.

* In absence.

University of London

The roll of honour published in the *Gazette* of Dec. 29 includes the names of the following medical men:

Staff—Colonel Sir Norman Hill, RAMC, Major C. F. Rainer, RAMC, and R. R. Watts.

Graduates and Students—Surgeon Rear-Admiral G. L. Buckeridge, RN, Surgeon Lieutenant O. S. Davis, RNVR, Captain M. Evnine, RAMC, Captain A. D Fisk, RAMC, Major R A
Foucar, RAMC, Colonel L. A J. Graham RAMC, Captain R. G. H.
Jones, RAMC, Wing C
J. T. Robins … Outtin, RAFO, Captain
Soutter, MB, … Sharpe, RAMC, Dr. L. J.
RAMC, and Ca … Captain N. N. Wilson,

The following have been recognised as teachers of the university:

Dr. A. N. Drury, FRS, as a teacher of pathology at the Lister Institute of Preventive Medicine; Dr. R A. Gregory (physiology at University College); Dr. C. C. N. Vass (physiology at St. Thomas's Hospital medical school); Mr. J. Roydon Peacock (oto rhino-laryngology at St. George's Hospital medical school); Dr. H. O Schild (pharmacology at University College); Mr. R. Watson-Jones (orthopedics at the London Hospital medical college); Dr. Henry Wilson (mental diseases at the London Hospital medical college), and Dr E. C. Amoroso (histology and embryology at the Royal Veterinary College).

University of Manchester

Dr. Brian Schofield has been appointed demonstrator in human physiology, and Dr. N. J. Caldwell demonstrator in pathology.

Department of Health for Scotland

Dr. R. J. Peters has been appointed deputy chief medical officer in the department in succession to Prof. T. Ferguson. Dr. W. D. Hood has also been appointed a senior medical officer in the department.

Dr. Peters, who is 49 years of age, was educated at Hutcheson's
Grammar School, Glasgow, and graduated in medicine at Glasgow
University in 1918. He entered the service of the Glasgow public
health department in 1921, and was appointed deputy medical
officer of health in 1935 and senior deputy medical officer in 1939
He served in the RAMC in the last war. With Prof. J. M. Mackin-
tosh and Prof. C F. W. Illingworth, Dr. Peters has been carry-
out the survey of hospitals in the West …
Dr. Hood has b
… and
… of
… He
… has held
… roydon,
… of the

Faculty of Radiologists

The therapy section of the faculty will meet at the Royal College of Surgeons, Lincoln's Inn Fields, London, WC2, on Friday, Feb. 16, at 2 30 PM, when Dr Robert McWhirter, Dr H. D Wyatt, and Dr. F. Hernaman-Johnson will open a discussion on ankylosing spondylitis.

Royal College of Physicians of London

Mr. B. H. C. Matthews, SC D, FRS, will deliver the Oliver-Sharpey lectures at 4 PM on Tuesday and Thursday, March 13 and 15, at the college, Pall Mall East, SW1. He is to speak on the effects of high altitude and mechanical stresses on man.

Royal College of Surgeons of England

The first course of professorial lectures on anatomy and applied physiology will be delivered at the college, Lincoln's Inn Fields, WC2, on Mondays, Wednesdays, and Fridays from Feb. 19 to March 16. Prof. John Beattie will give the lectures on applied physiology at 2.30 PM, and Prof. A. J. E. Cave the lectures on anatomy at 4 PM. Fellows and members of the college are entitled to attend, and on this occasion the lectures are also open without fee to other medical practitioners and advanced students.

Society of Apothecaries of London

Mr. Eardley Holland, FRCOG, will speak at the Apothecaries Hall, Black Friars Lane, EC4, on Tuesday, Feb. 20, at 2.30 PM. His subject is to be the new obstetrics and gynæcology.

Middlesex County Medical Society

A meeting will be held at Staines County Hospital, on Thursday, Feb. 22, at 3 PM, when Dr. A. Barham-Carter will speak on the treatment of some hysterical manifestations and Mr. N. M. Matheson on the diagnosis of urinary tuberculosis.

Science (Research) Society

Dr. G. Scott-Williamson will take the chair on Saturday, Feb. 24, at 3 PM, at BMA House, Tavistock Square, London, WC1. when Mr. E. W. Russell and Lady Eve Balfour will open a discussion on soil biology.

Royal Society of Tropical Medicine and Hygiene

At 26, Portland Place, London, W1, on Thursday, Feb 15, at 3 PM, Prof. P. A. Buxton, FRS, will speak on the use of the new insecticide DDT in relation to the problems of tropical medicine.

Poliomyelitis in USA

In his birthday message broadcast from the White House on Jan. 30 by Mrs. Roosevelt, President Roosevelt said that the 1944 epidemic of poliomyelitis was the worst since 1916. But thanks to public support for the National Foundation for Infantile Paralysis the very best in medical care and treatment had been assured for everyone.

Royal Dental Hospital of London

Sir Robert Hutchison has been appointed consulting physician in succession to the late Sir Humphry Rolleston.

Medical Society of London

On Monday, Feb. 12, at 5 PM, at 11, Chandos Street, W1, Sir Alexander Fleming, FRS, and Dr. Izod Bennett will open a discussion on the uses and limitations of penicillin treatment.

Films on Anæsthesia

The three films reviewed in THE LANCET of Dec. 9, p. 773, can be hired from the Central Film Library, Imperial Institute, Exhibition Road, SW7.

Mass Radiography in London

During its first year of work the London County Council's mass-radiography unit examined patients and staff (3810 people) at two large mental hospitals. Of 45,682 other persons examined, including workers in factory and office, Civil Defence personnel, and children in secondary schools, 335 (0·73%) were referred for further investigation, and of these 112 (0·24%) were advised to enter hospital or sanatorium. Heart abnormalities were discovered in 83 cases. The unit has operated at five static centres, but as soon as conditions permit the apparatus will be taken to the worker, rather than the worker to the unit.

Science in Peace

The Association of Scientific Workers is holding a national conference on this subject on Feb. 17 and 18 at the Caxton Hall, Westminster. At the first session, on Saturday afternoon, the conference will consider ways of securing an expanding economy and full employment. On Sunday morning it will deal with the future development of science. At the final session on Sunday afternoon, devoted to science in everyday life, the speakers will include Mr. F. Le Gros Clark, Dr. H. Joules, and Prof. J. D. Bernal, FRS. Information and tickets from Mrs. B. Ryerson, A SC W, Hanover House, Holborn, London, WC1.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED JAN. 27

Notifications.—The following cases of infectious diseas were notified during the week: smallpox, 0; scarle fever, 1510; whooping-cough, 1625; diphtheria, 450 paratyphoid. 3; typhoid, 3; measles (excluding rubella), 12,941; pneumonia (primary or influenzal) 1307; puerperal pyrexia, 141; cerebrospinal fever, 81 poliomyelitis, 7; polio-encephalitis. 0; encephaliti lethargica, 3; dysentery, 295; ophthalmia neonatorum 47. No case of cholera, plague, or typhus fever wa notified during the week.

The number of service and civilian sick in the Infectious Hospital of the London County Council on Jan. 24 was 952. During th previous week the following cases were admitted: scarlet fever, 33 diphtheria, 21; measles, 75; whooping-cough, 24.

Deaths.—In 126 great towns there were no deaths from enteric fever, 12 (0) from measles. 2 (0) from scarlet fever, 14 (1) from whooping-cough. 4 (0) from diphtheria, 46 (5) from *diarrhœa and enteritis under two years*, and 87 (11) from influenza. The figures in parentheses are those for London itself.

There were 9 deaths from diarrhœa at Birmingham. Birmingham reported 5 fatal cases of influenza, and Reading 4.

The number of stillbirths notified during the week was 198 (corresponding to a rate of 31 per thousand total births), including 18 in London.

Appointments

GIBSON, T. J., MB BELF., FRCSE: temp. full-time MO at Banbridge Hospital. co. Down.

O'CALLAGHAN, DESMOND, MB LOND., FRCS: acting surgical registrar, Westminster Hospital.

Births, Marriages, and Deaths

BIRTHS

BALLANCE.—On Jan. 20, at Oxford, the wife of Surgeon Lieutenant G. A. Ballance, RNVR—a son.

CUMMING.—On Jan. 29, in London, the wife of Lieutenant Alister Cumming, RAMC—a daughter.

HORGAN.—On Jan. 24, at Tralee, Eire, to Dr. Gwen Horgan (née Richards), the wife of Mr. M. J. Horgan, FRCS—a daughter.

ROBERTSON.—On Jan. 29, to the wife of Dr. J. M. Robertson, of Evesham—twin daughter and son.

STROTHER-STEWART.—On Jan. 27 in Edinburgh, the wife of Captain C. R. Strother-Stewart, RAMC—a son.

JACKSON.—On Jan. 31, in Birmingham, the wife of Captain Ian M Jackson, RAMC—a son.

MARRIAGES

FIGGIS—HARGREAVES.—On Jan. 27, at Harrow-on-the-Hill Morton Figgis, captain RAMC, to Jean Mary Hargreaves.

HOLDEN—SWAN.—On Jan. 30, at Shaftesbury, John Rushworth Holden, captain RAMC, to Bridget Mary Swan, VAD.

KERR—GOAD.—On Jan. 29, at Plymouth, David Kerr, surgeon lieutenant RNVR, to Gwyneth Goad, second officer WRNS

PITTS—CLAPHAM.—On Jan. 31, at Woodbridge. Robert MacLaren Pitts, surgeon lieutenant RNVR, to Eunice Joan Clapham second officer WRNS.

DEATHS

BUTLER.—On Jan. 29, at Hampton-in-Arden, Thomas Harrison Butler, DM OXFD, FRCS, aged 73.

COGAN.—On Jan. 24, at Chapel-en-le-Frith, Denis [illegible]

GILL.—On Feb. 2, at Hove, Samuel Ernest Gill, MD L

GLEESON.—On Jan. 30, at Dublin, Ella Gleeson, LRC

HOLMES.—On Jan. 29, at Langley Mill, Derbyshire Holmes, MB EDIN.

KITCHIN.—On Feb. 5, Mary Kathleen Forsaith Kitch MB, MSC LOND., barrister-at-law, Gray's Inn.

PETERS.—On Jan. 29, Edwin Arthur Peters, MD CA

ROBINSON.—On Feb. 2, at Stourport-on-Severn, Robinson, MRCS, aged 79.

SELLERS.—On Jan. 31, at Chesham Bois, Bucks, A EDIN.

STAMBERG.—On Aug. 19, in Jersey, Arthur Clemen MB EDIN., DCMS, Ministry of Pensions, Chann

WOODCOCK.—On Jan. 29, at Rottingdean, O Woodcock, MD MANC., aged 67.

The fact that goods made of raw materials in sho to war conditions are advertised in this paper sho as an indication that they are necessarily avail

ABDOMINAL INJURIES AT THE BASE HOSPITAL

R. MILNES WALKER
MS LOND., FRCS

W. R. S. HUTCHINSON
MB CAMB., FRCS

SURGEONS, ROYAL HOSPITAL, WOLVERHAMPTON, AND EMS

A LARGE number of general hospitals accustomed to dealing with civilians only are now acting as base hospitals, and treating casualties any time from 12 hours upwards after their wounds have been inflicted. Since base hospitals are now established on the Continent, it is unlikely that casualties will continue to arrive at quite such an acute stage of their illness, but some notes on the treatment of abdominal injuries in this phase may serve as a guide to those who will continue this work elsewhere. This aspect of abdominal injuries has been singularly neglected. Much has been written during this war on the methods to be employed in the forward areas, and judging by those patients who have been evacuated to Britain from the Continent during the present campaign . treatment has been of the very best, and in some : ances, as will be quoted, has yielded miraculous . lts. There is a general feeling however that if these patients survive the primary operation, and if the

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not dealt with properly and promptly may prolong the period of disability and even lead to disaster. This was brought home to us by the example of a sapper who was wounded in Italy in August, 1943, a shell fragment entering the left loin and perforating the descending colon, and who was only able finally to leave hospital with his wounds healed in November, 1944, fifteen months after his injury.

A careful record has been kept of the casualties with

the journey by air, and 6 received treatment at other hospitals in Britain before being transferred to this group. They include casualties with damage to the peritoneum, to abdominal viscera, or to the anal region necessitating a colostomy. The nature of their injuries can be summarised as follows:

Peritoneum penetrated			46
No visceral injury		3 (1 death)	
Visceral injury		43	
Peritoneum not penetrated			6
Visceral injury		5	
Colon	1		
Rectum	3		
Rectum and bladder	1		
Anal or perineal injury		4	
Total cases			55

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Site of 48 Visceral Injuries

	4	Spleen	3
tine	22	Kidney	4
	20	Ureter	1
	5	Bladder	7
	9	Abdominothoracic	8

more than one viscus was injured, while in the small and large intestines suffered. 28 (51%) had colostomies or wounds with the colon, and the closure of these considerable part of the work of the stage. One had two separate colostomies, 5 had both a colostomy and suprapubic bladder. In spite of such severe injuries, exception the patients arrived in good tribute to their early treatment and to n of their transport. To date there have been no deaths among this group after arrival in the area, with the single exception of one patient who had no visceral injury but died from septicæmia due to suppurative arthritis following an open wound of the knee-joint. Tribute must also be paid to the excellent records on the field medical cards, from which much of the information on which this paper is based has been culled; these notes were often made under most difficult conditions.

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atheter; on
nd liver, and

OVERLOOKED INJURIES

The surgeon at the base hospital must be constantly vigilant, when casualties first arrive, for any injuries which have been overlooked further forward. The standard of field surgical units is so high that these cases must be rare but that they do occur is evident from the following 2 examples, both emphasising the well-known risks of an entry wound in the buttock area.

Private A, wounded in the right thigh 1 inch below the ischial tuberosity. At the CCS toilet of the wound was carried out, but no foreign body was found. A catheter was passed, but the urine was not blood-stained so it was concluded that there was no injury to the bladder. On arrival in this country 48 hours after the wound was inflicted he complained of a little lower abdominal pain, and on questioning admitted that his urine had been blood-stained, though he had passed it freely. Cystoscopy was attempted, but lotion run into the bladder was not returned, and the organ could not be distended. On suprapubic exploration a prevesical hæmatoma was discovered, with perforations in the anterior and posterior walls of the bladder. A fragment of the ischial ramus lay f

½ in. long,

After remc

drainage of this and the prevesical space, he made an uneventful recovery and all wounds were healed 5 weeks later.

½ in. from the ight knee-joint. The wounds were excised by a field surgical unit, and the leg put in a Tobruk plaster. When he arrived in this country 2 days later his condition was poor, and he passed very foul urine. At operation the presence of a rectovesical fistula was confirmed, but there was no free fluid or foreign body in the peritoneum. An iliac colostomy was performed, and the bladder drained by a urethral catheter; 13 days later cystoscopy was carried out by Mr. Hugh Donovan, and the foreign body was seen lying inside the bladder; it was removed by suprapubic cystotomy and measured 1 in. by 1/5 in. The fistula healed without further operative intervention, and it was possible to close the colostomy a month later.

INTESTINAL OBSTRUCTION BY ADHESIONS

Men who have had intraperitoneal injuries are liable to acute intestinal obstruction as a result of adhesions at any time during the postoperative period or later, but they seem to be particularly prone to this about the 4th to the 8th week. Three examples have occurred in

taken. In each of the case was caused by a single banc all intestine, but re also present; one of these injuries that the account on ayth and the highest tribute on and his associates at the re responsible for his early his card—

"Corporal B, Polish Army. Penetrating abdominal wound, exit left upper loin, arrived CCS 1500 hr. Operation 2100 hr. Incision left loin, separation of diaphragm on left side from ribs, hæmopneumothorax, fractures 8–12 ribs, diaphragm deficient in anterior part. Peritoneum here to close sucking, and of blood as much as possibl Laceration of transverse col Laceration of spleen; splenectomy. Three lacerations of jejunum; sutured. Abdomen incompletely closed, anterior wound excised. Scalp wound and wound of left elbow untouched—condition too poor." of this remarkable case d measures, but gastric su

1½ million units of penicillin administered systemically during this period. He was evacuated by air 19 days later. On arrival at the base hospital his general condition was excellent, the left lung was fully expanded, and there was no fluid in the left pleura; pus was discharging freely round his colostomy and he had some fever. A fortnight later he suddenly showed symptoms of acute intestinal obstruction, and operation revealed that this resulted from strangulation of a loop of small intestine by a band running from the mesentery to the jejunum at a point where it appeared that the latter had been sutured. Since then a sequestrum from the 9th rib has been removed, and the colostomy closed after preliminary crushing of the spur 15 weeks after his injury. At this last operation it was noted that the opening through which the colon had been brought out was situated entirely above the costal margin between the 8th and 11th ribs, so this must be a unique example of a truly thoracic colostomy.

CLOSURE OF COLOSTOMIES

It has already been noted that more than half these patients had a fistula into the colon. They fall into two groups—those with a formal artificial anus performed at the primary operation, and those with a fæcal fistula through the wound which developed either at the time of injury or as the result of sloughing of the wall of the colon.

In warfare an artificial anus is made either to exclude the flow of fæces from an injured portion of the colon or rectum, in which case the site is in the transverse or sigmoid portions, or to exteriorise an injured segment of the bowel, when it may involve any part of the large intestine from the cæcum to the sigmoid. When performed as an exclusion operation it will almost certainly have a satisfactory spur which can be crushed in order to facilitate closure, but when an injured loop has been exteriorised there is often no such spur and the two ends of the loop diverge. How soon can such an artificial anus be closed?

When the actual injured part has been exteriorised, and there is no lesion in the intestinal tract lower down, closure may be performed as soon as the patient's general condition is satisfactory and any local inflammation round the opening has subsided. In one case it was possible to do this 17 days after the injury, but usually the period is rather longer. Where there is injury lower down closure should be delayed until it is quite certain that the wound in the colon or rectum is soundly healed, and if in doubt it is better to err on the longer side, for these wounds have an unpleasant knack of breaking down again if they become contaminated by fæces before they are completely epithelialised. It may be necessary to inspect the rectum with a sigmoidoscope, or to inject opaque oil or a coloured dye into the wound to make certain that the fistula is closed, but it is not always practicable to wait until the sinus is quite healed because this may considerably delay the patient's eventual recovery.

The technique of closure has been admirably described by Turner Warwick (1943), whose account is commended to all who treat these cases. We prefer the intraperitoneal method as a routine for the following reasons: (1) the wider exposure of the loop of colon allows more accurate suturing without tension; (2) it is sometimes found that another organ such as small intestine is adherent to the loop and can be freed: (3) the opening in the abdominal wall can be repaired with reduced risk of a subsequent hernia: (4) it can be ascertained with certainty that there is no kinking. If it appears that the lumen will be reduced when the suturing is completed, incisions should be carried upwards and downwards along the antimesenteric border of the colon and included in the suture line. In some of our cases the colostomy head has been swollen because the opening in the parietes has been too small, possibly as a result of scarring. In such cases the thickened mucosa is excised, and in a few instances it has been found advisable to remove the whole circumference of the bowel and perform an end-to-end anastomosis.

With careful operative technique the risk of peritoneal infection is slight. Sulphanilamide powder is dusted over the suture line before the abdomen is closed, and preoperative lavage of the colon both above and below the stoma is most important. There is evidence that the administration of sulphasuxidine in doses of 20 g. a day for 4 days diminishes the bacterial flora of the colon to a remarkable extent (Mackenzie 1944) and its use should not be omitted.

Fæcal fistulæ through wounds in the flanks, particularly if associated with osteomyelitis of the ileum or lower ribs, need special consideration. No real improvement in the local infection can be hoped for while fæcal contamination continues, and steps should be taken to check this as soon as the patient's condition permits, if it has not already been done at the primary operation. When the wound affects the right half of the colon the fistula is best closed by performing an end-to-side anastomosis between the lower end of the ileum and the transverse colon; such an operation involves no interference with the infected area round the wound, and in the one case where this step was taken the immediate improvement in both general and local conditions was striking.

Trooper C sustained multiple wounds of the chest wall, right flank, right buttock, and both thighs. At operation a compound fracture of the ilium was noted, but laparotomy revealed no intraperitoneal injury. Five days later a fæcal fistula was present just above the iliac crest. On his arrival at the base hospital following evacuation by air after another 5 days, his condition was only fair, and fæces were pouring from two wounds in the right flank. A fortnight later an ileocolostomy was performed, secondary suture of some of his other wounds being carried out at the same time. He made great improvement, and 3 weeks later all wounds were healed except the two in the right side. Some sequestra from the iliac bone were removed, and now 3 months after his injury the only wound is a small opening just admitting a finger tip through which cæcal mucosa prolapses. He is at the time of writing on "compassionate" leave because his wife has given birth to twins, but will have the fistula closed as soon as he returns.

In dealing with infected wounds of the left side of the colon causing extraperitoneal fistulæ it is necessary to carry out a transverse colostomy, and exclude the flow of fæces from the wound before attempting to close the fistula. When the infection has been overcome the opening in the colon should be adequately exposed, a step which may necessitate opening the peritoneum, and the defect carefully closed without tension. Some mobilisation of the colon may be required to effect this because it is apt to have become fixed by adhesions.

SMALL-INTESTINE FISTULÆ

Only 2 fistulæ of the small intestine occurred in this series—one had been performed as an ileostomy on the sixth postoperative day to relieve distension, and had closed spontaneously when the patient arrived at the base hospital; the second was discharging jejunal contents profusely, and had to be closed by operative means at an early date because his nutrition was inadequate. For this last reason jejunal fistulæ may be very serious, and if the patient is losing weight there should be no delay in closing such openings even if the patient's condition is poor.

WOUNDS OF THE RECTUM AND PERINEUM

Penetrating wounds of the buttock were common during the Normandy campaign, and such wounds are particularly likely to give rise to retroperitoneal injury of the rectum. These patients will usually have had an iliac colostomy performed before they arrive at the base, but an example already quoted in[illegible] that such injuries may be overlooked. Adequa[illegible] of the postrectal space is essential, and if [illegible]s any sign of spreading infection the coccyx must [illegible]oved and the space as far up as the wound in the [illegible]n laid open and loosely packed with vaseline gau[illegible]me of the smaller perforations close spontaneo[illegible]hen a colostomy has been performed, but othe[illegible]ain as fistulæ which gradually acquire rigid ma[illegible]nd fix the rectum to the sacrum, thus making re[illegible]fficult. Much time and trouble might be saved i[illegible]ttempt were made at the primary operation, when [illegible]ostomy is done, to close the perforation in the r[illegible] if it is accessible at the time the postrectal spa[illegible]rained; this should of course only be done if the pa[illegible]s general condition warrants the extra time taken [illegible] there is not already a spreading cellulitis. [illegible]olostomy should not be closed until it is quite c[illegible] that the fistula is healed, and it may be advisable to verify this by examination with the sigmoidoscope.

Wounds of the perineum have been included in the series when they have been severe enough to warrant a colostomy, which saves much time in procuring healing. When the danger of contamination is removed secondary suture or skin-grafting can be carried out; one such case in this series is complicated by osteomyelitis of the ischium.

SUPRAPUBIC CYSTOTOMY

Some say there is no need to suture wounds of the bladder, provided adequate drainage is carried out, but the failure to do so at the primary operation may lead to serious consequences, as is illustrated by the following case.

Private D. received a rifle wound, the bullet entering the left loin and coming out through the right thigh. Laparotomy 21 hours later showed a badly damaged loop of ileum which was removed. Tears in the muscular coat of the rectum were repaired, and of the two large wounds present in the bladder the one on the left side was sutured and suprapubic drainage established. A week later he was passing urine by the urethra. A month afterwards urine began to leak from the exit wound in the thigh, and he developed an acute suppurative arthritis of the right hip. The suprapubic fistula was reopened, the bladder dissected free from the right side of the pelvis, and the perforation [illegible] At the same time the thigh wou[illegible] drained, and it appeared that ther[illegible] from the bladder, through the hip-[illegible] this operation he has been making steady progress.

Wounds in the bladder should therefore be repaired at the primary operation whenever possible, in addition to [illegible] th[illegible] drainage. Provided inf[illegible] bladder is grossly [illegible] the suprapubic tube may be removed 2 weeks after the injury, and in all probability the urinary fistula will close in a few days. No difficulty has been experienced in the remaining six cases of bladder injury in this series. When there is both a suprapubic drain and a colostomy the bladder can usually be allowed to close first, but if further operative measures are required on the bladder, and none on the colon or rectum, the colostomy is closed first and thus a cleaner field can be secured for the bladder repair. If operative measures are to be carried out on the urethra by the perineal route they should be undertaken while the fæcal flow is still diverted from the anus. We have encountered 2 patients (not included in this series) in whom a suprapubic cystotomy had been performed for wounds of the penile portion of the urethra. No noticeable difference in healing has been observed when these are compared with others in whom the urinary flow had not been diverted, and it seems unnecessary to do a primary suprapubic cystotomy in these cases.

ABDOMINOTHORACIC WOUNDS

This series contains 8 patie[illegible] and [illegible] T[illegible] O[illegible] of[illegible] w[illegible] to his pleural cavity. [illegible] he needed no further attention [illegible] to the chest led through the diaphragm into the liver, was packed. In the second the wound, which and secondary suture was carried [illegible]

One patie[illegible] and the [illegible] eventually [illegible] wound of the right lower chest, [illegible] patient, who had a penetrating suspected until he [illegible] chest, no abdominal lesion was [illegible] ng fluid con-[illegible] evidently the [illegible] ner operative [illegible] and his wounds healed and the other below his diaphragm, [illegible] two metallic foreign bodies, one just above remain.

One soldier whose spleen and colon were injured, as well as the pleura and diaphragm, had a hæmothorax which required aspiration on three occasions, while 3 others had blood-stained effusions which became infected [illegible] needed drainage either by rib-resection or intercostal catheter; one of these had [illegible] and liver, and another to [illegible]

RESIDUAL ABSCESS

It stands to the credit of the efficient treatment which this group of patients received in the early stages that in only one of them was there a residual abscess in the peritoneal cavity—a pelvic abscess following [illegible] the base which required treatment with iron and on a few occasions by blood-transfusion.

CONCLUSION

In 55 soldiers wounded in the abdomen during the campaign in Normandy and the Low Countries a review has been made of the [illegible] they had arriv[illegible] after [illegible] Kingdom. Th[illegible] nited [illegible] of the fact that [illegible] view [illegible] to be evacuated by air, and no conclusions can be drawn from them regarding methods of primary treatment or the mortality-rate. Very few of them caused anxiety on arrival, in spite of extensive injuries, and we can only attribute this to the liberal employment of blood [illegible] wounds of the large intestine. [illegible] these patients had other wounds apart from their abdominal injuries, but in almost every case it was the wound in the belly which dominated the clinical picture.

On arrival of a [illegible] of [illegible] ave had wounds soc[illegible] be examined as [illegible] symptoms such as pain, vomiting, or hæmaturia must be accounted for, and raising of the pulse-rate or temperature explained. Pain or fever may be due to a residual abscess in the abdomen, or to an infected wound which is draining inadequately. A full course of systemic penicillin therapy will probably have been administered before arrival at the base, but if this is not the case, or if there are any signs of spreading inflammation, systemic penicillin should be instituted at once, in the latter instance without waiting to determine the nature of the in[illegible] [illegible] ther course of penicillin should, [illegible] ore undertaking any operation [illegible] wound provided the infecting [illegible] is penicillin-sensitive. The onset of vomiting and colicky pain should [illegible] picion of acute [illegible] if examination [illegible] be undertaken [illegible]

With the exception of fistulæ into the upper part of the small intestine, there is no hurry about the closure of colostomies and other fæcal fistulæ, and the patient's general condition should be [illegible] Most small intestine [illegible] not those of the colon [illegible] fistulæ are not final[illegible] which the patient h[illegible] series of operations are necessary to close them, [illegible] and often a [illegible] over, when fæcal contam[illegible] continued suppur[illegible] steps must be take[illegible] a short-circuit op[illegible] proximal colostomy. Scrupulously careful technique is essential if the operations for closure of fæcal fistulæ are to be uniformly successful, while scarring and adhesions may add to the difficulties.

Suprapubic bladder fistulæ usually close spontaneously, but before removing the tube it is essential to be sure that the wounds in the bladder are healed and that there is no obstruction to the urethra; if the bladder wounds have not been sutured at the primary operation they may require repair later. Abdominothoracic wounds, after their early treatment, present no peculiar problems, the injury to each cavity requiring attention as a separate entity, provided no communication between the two cavities persists.

Many of these patie[illegible]

but a period of rehabilitation does much to restore their strength and their self-confidence.

Undoubtedly other complications will arise which we have not encountered in this short series, but our experience and conclusions are put forward in the hope that others with a larger experience will add their views on an aspect of treatment of abdominal injuries which has been rather neglected.

It is comforting that none of them suffered in any way from their early evacuation to England, thanks to the excellent organisation of the air-transport service. Though their treatment is not yet completed, there is every reason to suppose that, with the exception of one man who died as a result of another wound, they will all survive, and will be left with little or no permanent incapacity as a result of their abdominal injuries.

We wish to thank our colleagues under whose care some of these patients were admitted, and who have carried out the treatment and permitted us to make use of the records: Mr. Vincent Patrick, Mr. John Stretton, Dr. J. E. Stanley Lee, and Mr. W. E. Wimberger; also Mr. B. Lawson who kept the records at one hospital for us

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HUMAN TRANSMISSION OF INFECTIVE HEPATITIS BY THE ORAL ROUTE*

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ROBERT WARD, MD, V. A. DRILL, PHD, AND

NANCY H. ALLISON, AB, *assisted in this study*

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THE experimental transmission of infective hepatitis to man has rapidly added to knowledge regarding this disease. From such experiments as have been published, it now appears that infective hepatitis can be transmitted to man by a number of routes; that the ætiological agent (probably a virus) is in the blood-stream before the onset of and during jaundice; and that it is present in fæces during acute stages of the disease, and probably also in nasal washings. From certain newer (unpublished) experiments by one of us (W. P. H. and collaborators) it also appears that the agent of infective hepatitis can be carried in serial passage in man (2 passages), thus conclusively indicating the infectious nature of the disease, and that like the agent of serum jaundice (with which it may be identical) it is filtrable and markedly heat-stable, withstanding 56° C for half an hour. All this work has been carried out within the past 2 or 3 years and a list of some of the pertinent reports is given in the table.

Among early claims of success in transmission are those of Voegt (1942) in Germany. Details of this work are incomplete. Voegt describes having infected one out of four volunteers by feeding them duodenal fluid obtained from two patients who were late in the clinical course of infective hepatitis. He also claims to have produced hepatitis experimentally, by inoculation of human serum and by the ingestion of urine, and of hæmolysed red blood-cells.

In Lieut.-Colonel Cameron's investigations (1943), carried out in Palestine, serum and whole blood from cases of hepatitis were injected intramuscularly. Seven volunteers were inoculated, of whom six could be followed. One of these developed jaundice after 30 days. During the next 6 months all the rest developed jaundice, although details as to the time of onset are not available.

SERUM JAUNDICE

Included in the table are certain transmission experiments on homologous serum jaundice, because it has not yet been shown that the icterogenic agent responsible for serum jaundice is any different from that responsible for infective hepatitis. A discussion of this subject will be found in the recent papers by Findlay, Martin, and Mitchell (1944). Among the early planned transmission experiments in serum (post-vaccinal) jaundice were those of Brigadier Findlay and Major Martin (1943). They used nasal washings taken from three patients in the pre-icteric or early icteric stages of jaundice developing after inoculation against yellow fever. The material was administered intranasally, or orally. Resulting experimental cases were mild, and more or less indefinite. They occurred after incubation periods of 28, 30, and 50 days. In the United States, Oliphant et al. (1943) of the United States Public Health Service have made an extensive series of tests on the transmission of serum jaundice by subcutaneous inoculation in more than a hundred subjects. The incubation periods in their series of inoculation cases ranged from 75 to 130 days. In England, MacCallum and Bauer (1944) have confirmed the results of both groups of workers. Similar confirmation of this work on serum jaundice has come from two of the commissions working under the Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the US Army (Paul et al 1944, Stokes 1944).

In summary of all this recent experimental work it now seems that serum jaundice, which has not been considered as "contagious" as infective hepatitis, can possibly be transmitted by nasopharyngeal washings with a relatively short incubation period. Data on the infectivity of the fæces in serum jaundice as yet are unavailable. Furthermore, although the icterogenic "capacity" of various lots of serum, or individual samples of serum, differs in the rates at which serum jaundice is produced, as well as the lengths of the incubation period, the majority of such inoculation cases, whether induced by the intracutaneous, subcutaneous, intramuscular, or intravenous routes, have occurred after a relatively long incubation period, generally ranging from 60 to 100 days. This conforms to the usual experience in outbreaks of jaundice following the administration of yellow-fever vaccine or icterogeni serum, of which there are many reports.

HEPATITIS VIRUS IN FÆCES

These experiments on serum jaundice have now paved the way to a new and important series of discoveries which indicate that in infective hepatitis (whose incubation period is about 30 days) the virus is in the fæces, and that the disease can be induced (after a "30 day incubation period) by feeding such material to volunteers. This finding has been reported recently in a short note by MacCallum and Bradley (1944). Their material was collected from several individuals in the pre-icteric stage of infective hepatitis or within 24 hours of the appearance of jaundice. Positive results were obtained both from nasopharyngeal washings (which gave rise to subicteric hepatitis in volunteers) and from fæces (which gave rise to hepatitis with jaundice) when fed or sprayed into the nose and the pharyngeal region of persons suffering from rheumatoid arthritis. The experimental disease thus produced occurred in a small number of instances after a relatively short incubation period—27 to 31 days in rheumatoid arthritics.

These results have also been confirmed and somewhat enhanced by recent experiments of the Neurot Virus Disease Commission of the US Army (Havens et al 1944) who have employed healthy human subjects f their tests. Material from cases of infective hepa (and serum jaundice) collected from American and Brit troops in the Middle East, was administered by vari routes to five different groups of human volunt Preliminary data on this work are also included in th table. Briefly the main findings in this last group experiments can be summarised as follows.

> When one lot of icterogenic serum was fed in gel capsules to three men, two of them contracted hepati with relatively short incubation periods of 30 days, and third after a longer incubation of 84 days (this last was insidious in onset, mild, and non-icteric and is fore not included in the table).
>
> When fæcal material was fed in a similar together with urine and stool extracts which had be

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* Work done largely under the Commission on Neurotropic Virus Diseases (Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Service, Office of the Surgeon General, US Army).

EXPERIMENTAL CASES OF HEPATITIS WITH JAUNDICE IN VOLUNTEERS AS REPORTED BY VARIOUS INVESTIGATORS

Parenteral administration						
Authors	Year	"Inoculum"[1]	Route inoc.[2]	No. tested	No. pos.[3]	Incubation period (days)
Voegt	1942	Serum—IH	sc	?	1	19(?)
Cameron	1943	Blood Serum } IH	im	6	6	30–120(?)
Oliphant et al	1943	Serum—SJ	sc	104	16	84 ±
MacCallum and Bauer	1944	Serum—SJ	sc	15	6	54–127
MacCallum and Bradley	1944	Serum—IH	sc	6	3	64–92
Paul et al.	1944	Serum { "SJ" SJ	sc ic	10	7	72–94
Stokes and Neefe	1944	Serum—SJ	iv	6	5(?)	73–142
Havens et al.	1944	Serum { SJ "SJ"	ic	5	3	56–70

Oral (or nasopharyngeal) administration						
Authors	Year	"Inoculum"[1]	Route inoc.[2]	No. tested	No. pos.[3]	Incubation period (days)
Voegt	1942	Duodenal fluid—IH	oral	4	1(?)	28
,,	1942	Urine—IH	oral	?	1	?
,,	1942	Blood—IH	oral	?	1	?
Findlay and Martin	1943	Nasal wash—SJ	in	4	3(?)	28–50
MacCallum and Bauer	1944	Serum—SJ	in	10	1(?)	36 (80)
MacCallum and Bradley	1944	Nasal wash—IH	in	16	0	..
,,	1944	Urine—IH	in oral	10	0	..
,,	1944	Fæces—IH	in	26	3	27–31
Havens et al	1944	Serum—"SJ"	oral	3	0	..
,,	1944	Serum { "SJ" IH	oral	3	3	30–30
,,	1944	Fæces (frozen) Fæces & urine (extr. dried) } IH	oral	3	2	20–22
,,	1944	Fæces and urine (extr. dried)—IH	oral	3	0	..

1. IH = Material from one or more cases of infective hepatitis.
SJ = ,, ,, icterogenic serum or one or more cases of serum jaundice.
"SJ" = Material collected in area endemic for infective hepatitis but actual case source was not determined.
2. im = intramuscular; in most cases intra-
3. developed have been

filtered and dried by one of us (C. E. v. R.)—to three volunteers, two acquired jaundice at intervals of 20 and 22 days.

A third group of three men received the urine and stool extracts alone, and no case of jaundice resulted.

In the course of these same experiments a pool of icterogenic serum from cases of questionable serum jaundice (see table) was inoculated intracutaneously into five volunteers, and it gave rise to frank hepatitis in three with the usual long incubation periods of from 56 to 70 days. This same serum pool failed to induce the disease when fed to three volunteers.

CONCLUSION

The sum total of these latest results indicates, so far, that in cases of infective hepatitis the virus or icterogenic agent is *in the fæces*, and that the disease can be produced in man by feeding such material in capsules or by spraying it into his nasal and pharyngeal passages. Similarly the disease can be produced by feeding *serum* from cases of infective hepatitis. In these feeding cases, both in the series reported by MacCallum and Bradley (1944) and those in the series by Havens et al. (1944), the incubation periods have on the average been about 28 days, being shorter than the incubation periods of typical serum jaundice.

From these experiments one main feature becomes apparent: there is justification for suspecting that the intestinal-oral circuit is part at least of the natural route of spreading infective hepatitis. Others have already indicated that their practical experience with epidemics of infective hepatitis among British and American troops in the Middle East is in keeping with this idea.

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PENICILLIN BY MOUTH[1]

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DURING routine examination of the penicillin sensitivity of organisms isolated from patients undergoing or
the "gutter
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properties attributed to penicillin are: (i) it is stable as a salt between pH 5 and pH 7; and (ii) it is destroyed by acids and alkalis and by heat.

To ascertain whether sensitivity to pH and to heat was measurably altered in the passage of penicillin through the body the following experiment was undertaken:

> The urines of 25 patients receiving intramuscular injections were diluted to contain approximately 25 units per c.cm. A control solution of 25 units per c.cm. of penicillin in saline was prepared. Urines and control were now divided into aliquot portions, and reactions were adjusted so as to give within each set of portions a range of pH from 2 to 10. All were allowed to stand at room temperature for 3 hours, after which they were titred.
>
> again titred.

The results (fig. 1) showed that the antibacterial substance in the urine was appreciably more resistant to changes in pH and to heat than was the original penicillin solution. It stood up well to a reaction of pH 2.2 and was only partially affected by autoclaving. Sodium penicillin mixed with normal urine behaved in the same way as a saline solution. The effects of boiling, as judged by titration of inhibitory power, are not in all

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[1] This paper has been much abridged. To prevent delay in publication no proof has been sent to the authors.—ED. L.

TABLE I—PENICILLIN ACTIVITY (RECORDED IN ZONE DIAMETERS) IN VARIOUS MIXTURES FOLLOWING pH CHANGES

Solutions	pH	Incubated 3 hr.						Incubated 6 hr.						pH			Incubated ½ hr.					
		Undiluted		1 : 20		1 : 100		Undiluted		1 : 20		1 : 100					Undiluted		1 : 20		1 : 100	
		C	F	C	F	C	F	C	F	C	F	C	F				C	F	C	F	C	F
Egg	7·25	38	44	27	37	18	24	23	35	15	28	13	20	2·44	All solutions incubated 1 hr. and readjusted to pH shown in braced column	6·99	21	31	11	19	11	19
Taurocholate	7·31	38	44	22	36	19	25	22	33	20	27	11	20	2·31		6·99	20	30	11	19	—	—
Milk	7·33	34	41	27	32	16	24	26	33	22	27	14	21	2·5		7·99	20	26	—	—	—	—
Plasma .	7·15	28	38	nd	nd	nd	nd	24	32	nd	nd	nd	nd	2·7		7·15	12	22	—	—	—	—
Cholesterol .	7·50	38	44	26	30	15	19	27	35	20	28	14	22	2·41		7·99	—	—	—	—	—	—
N/saline ..	7·33	32	40	20	32	15	27	24	34	22	30	15	22	2·44		7·8	—	—	—	—	—	—
Distilled water	7·67	31	37	22	29	15	20	24	35	16	32	16	20	2·44		7·99	—	—	—	—	—	—

All undiluted solutions contained 100 units per c.cm. C=Oxford assay cylinder. F=Filter-paper disc. —=No inhibition. nd=not done.

respects the same as those of autoclaving, and are not included in fig. 1.

It occurred to us therefore that it might be possible to stabilise penicillin outside the body, so that it could be given by mouth.

PAST INVESTIGATIONS

Administration of penicillin by mouth has been generally considered unsuitable because of destruction by the gastric juices.

Activity was reported as present in both blood and urine after introduction of penicillin into the intestine of the rat (Chain et al. 1940). Florey and his collaborators (Abraham et al. 1941), using the duodenal route, found that penicillin could be detected in the blood of the cat but not the rabbit. Antibacterial concentration persisted considerably longer after intestinal than after either intravenous or subcutaneous administration; and in both cats and rabbits penicillin was found in the bile. In experiments on man, they introduced 16,000 units by duodenal tube—twice the dose they had up to then given by vein—and again found that the inhibitory level of the blood persisted longer and was steadier than after intravenous administration. When they gave penicillin with alkali by mouth to a patient with urinary infection (*Staph. aureus*) the infection disappeared, this being attributed wholly to the amount excreted in the urine. Tests of the blood for bacteriostasis are not recorded.

These workers suggested trial by mouth with the addition of substances which would raise the pH of the gastric contents, but thought it possible that this route would always require larger dosage than was needed by injection. Florey and Florey (1943) reported the treatment of one patient with penicillin enclosed in 'Salol'-coated capsules, and of a second to whom it was given by duodenal tube; but there was little if any improvement in either. We have been unable to find other nt references.

TABLE II—ZONES OF INHIBITION IN URINE OF S/SGT. D (HYPERCHLORHYDRIA) AFTER 15,000 UNITS OF PENICILLIN BY MOUTH IN VARIOUS SOLUTIONS

Time (hr.)	Saline			Plasma			Taurocholate plus cholesterol			Taurocholate (50,000 units)			Saline after sod. bicarb.			Egg after sod. bicarb.		
	vol. (c.cm.)	C	F	vol. (c.cm.)	C	F	vol. (c.cm.)	C	F	vol. (c.cm.)	C	F	vol. (c.cm.)	C	F	vol. (c.cm.)	C	F
1	70	—	—	136	17	36	86	10	17	126	17	26	92	17	27	80	20	30
2	51	—	—	41	—	—	30	12	20	24	13	21	55	18	29	73	21	31
3	73	—	—	76	—	—	40	—	—	32	—	—	82	18	30	42	20	31
4	67	—	—	50	—	—	72	—	—	30	—	—	52	17	27	66	19	28
5	44	—	—	56	—	—	38	—	—	52	—	—	37	—	—	58	19	27

C = Oxford cylinder. F = Filter-paper disc.

LABORATORY INVESTIGATIONS

In the experiments reported we used sodium penicillin of American manufacture. Several makes have been employed and have not differed in their behaviour to any appreciable extent. The calcium salt, which i more stable than sodium penicillin, is now on trial.

Having shown that penicillin is rendered less unstable in the body, we set out to find "stabilising agents" by which the drug could be made more suitable for oral administration. In choosing these we were largel guided by two factors. First, the fact that penicillin is excreted in appreciable quantities in the bile led us to try sodium taurocholate and cholesterol. Secondly we were influenced by the personal account of work done by Lieut.-Colonel R. J. V. Pulvertaft, formerly commanding our unit, who told us that he had rendered penicillin salts more resistant to heat, as judged by inhibitory power, by dissolving them in certain chemical mixtur and that he suspected that the important eleme might be sulphur. As we had no suitable pure chemi substances, we decided to try milk and eggs.

TABLE III—AVERAGE BACTERIOSTATIC ACTIVITY OF SERU OF PATIENTS AND VOLUNTEERS RECEIVING 20,000 UNITS OF PENICILLIN BY MOUTH IN VARIOUS DILUENTS

Time after dose (hr.)	No. tested	Dilution producing bacteriostasis		Time after dose (hr.)	No. tested	Dilution producing bacteriostasi	
		Complete	Partial			Complete	Partial
¼	3	—	1 : 1	1½	2	1 : 2	1 : 4
½	5	1 : 1	1 : 2	2	6	1 : 2	1 : 4
1	6	1 : 2	1 : 4	3	8	1 : 2	1 : 4

It was necessary first to know the range of activi for penicillin in saline at various pH levels. As fig. shows, the maximum occurs between pH 4·6 and p 8·0, although some inhibition can be demonstrat beyond those limits. The solutions were left at the t pH for 3 hours only, as being probably the longest ti they might remain in the stomach. Our figures coinci with those given by Foster and Wilker (1943), w continued the test to 100 hours, finding little change to 5 hours but an increasing narrowing of the range activity from then onwards, approaching an at pH 5·8. Penicillin dissolved in distilled water, seru and milk, tested through the same range, gave much same result.

We both now swallowed, 3 hours after breakfa 15,000 units in saline, and found that penicillin be detected in the urine passed half an hour later. activity demonstrable in urine passed for some h The same dose, at the same relative time, taken by t members of the laboratory staff, gave the same resul —with one important exception. By a happy for us (though not for him), this man, S/Sgt. D., show no inhibition in the urine. That this was due to hyp acidity of the gastric juice was confirmed by an tion of stomach contents, which gave a reaction of 1·29 one hour after food, and by the fact that pe was excreted in the usual way after an intramuscular injection. Several other diluents and mixtures were given him and others by mouth and it was found that the more complex substances, such as milk and cholesterol, gave constantly better results than the simpler ones, such as water and broth.

In the following experiment our object was to expose penicillin, mixed with various diluents, to conditions somewhat resembling the changes in pH to be met in the stomach and then in the blood after absorption from stomach or intestine.

To equal volumes of each diluent penicillin was added (100 units per c.cm.) The solutions were adjusted to a pH of about 7·5 and were incubated for 6 hours at 37° C, during which time inhibition was twice measured. The pH was then lowered to the neighbourhood of 2·5 and they were again incubated for 1 hr., after which the reaction was readjusted to pH 7–8 and the incubation and titring were repeated.

Table I shows [illegible] the first in[illegible] the pH was [illegible] distilled wa[illegible] and cholesterol solutions was destroyed; the penicillin in plasma and milk was seriously affected; and the least damage was suffered by the penicillin dissolved in raw egg. From this we conclude that some substance present in egg protects penicillin against an acid medium. Taurocholate also had some protective effect.

A dose of 50,000 units in taurocholate swallowed by S/Sgt. D. was followed by a small excretion in the urine; and one of 15,000 units in saline preceded by alkali gave a still more promising result. The most satisfactory excretion, however, was obtained when he was given alkali followed by penicillin mixed with raw egg (table II). Three other volunteers received this mixture, also with a leading dose of alkali, with uniformly successful findings. And finally the same dose of both alkali and egg-penicillin mixture was swallowed by a patient with achlorhydria, in order to test the risk of destroying activity by over-alkalisation. Excretion in this case was also normal.

Tests were now carried out to ascertain whether the concentration of penicillin in the serum of persons taking penicillin by mouth was as high as in those receiving it intramuscularly. It was found, both by plate and dilution methods, that 15–30 minutes after an intramuscular injection of 15,000 units the serum level rose sharply to 0·3–0·5 unit per c.cm.; but from that time it decreased until at 2–3 hours it became impossible to detect by plate methods, and in dilution tubes one could say no more than that the whole serum either completely or partly inhibited growth of the test organism (the Oxford *Staph. aureus*).

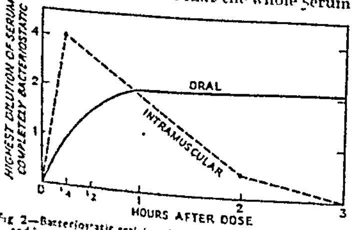

Fig. 2—Bacteriostatic activity of serum after oral administration and intramuscular injection of penicillin. The curve for oral administration is based on table II. The intramuscular dose was 15 000 units.

It was therefore desirable that some method of assay should be foun[illegible] which small quantities [illegible] fa[illegible]

[illegible] 1944). For the estimation of small quantities in serum, [illegible] be related to the findings of [illegible] the slide technique has been employed, and it has been found easier to perform this test by placing the coverslips directly on to the inside of the bottom of a petri dish.

Table III shows the bacteriostatic [illegible] of the serum of volunteers and [illegible] penicillin, in vari[illegible],000 units of [illegible]ith. Fig. 2 contrasts these findings with those obtained after intramuscular injection of 15,000 units.[2] When penicillin was taken by mouth the proportion excreted in the urine was generally found to be 75–80%, which is much the same as when it is administered parenterally; but, on the average, excretion continued for 5–6 hours after

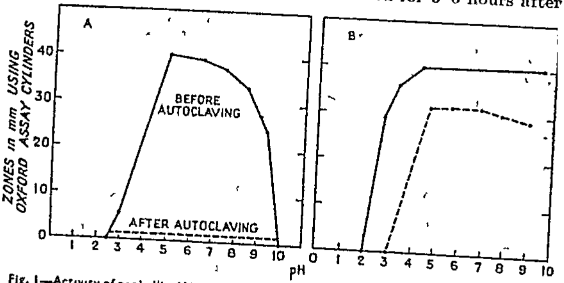

Fig. 1—Activity of penicillin (A) in saline solution (25 units per c.cm.), and (B) in patient's urine (approx. 25 units per c.cm.) at various pH, before and after autoclaving at 15 lb. for 15 min.

[illegible] a more refined one is used, minute traces of inhibitory substance can be detected for several hours longer.

The method employed as a routine for the large [illegible]

[illegible] mm. diam. [illegible] filter-paper cut in discs of [illegible] (Foster and Woodruff 1943). The two tests were always put up on the same plate, and the results compared, for occasionally one might give an obviously false reading, in which case it could [illegible]

[illegible] plates [illegible] results are always obtained.

For the most perfect zones it was found that the plates should be placed in the refrigerator for 3 hours before incubating at 37° C for 12 hours. When so treated, they are of course a little larger. A standard range of between 1 and 10 units of penicillin per c.cm. was also prepared, and the readings checked against the urine dilutions. For a more accurate reading, urine was diluted in the range of 0·3 to 0·7 unit per c.cm. and read by Hoogerheide's technique.

The laboratory investigations and the experimental doses given to volunteers during this work, extending over a period of 4 months, have required the use of no more than 1,220,000 units of penicillin.

CLINICAL TRIALS

We were now satisfied that penicillin could be given by mouth to patients with wide ranges of gastric pH and that a satisfactory bacteriostatic level would result in the blood. According to Garrod (1944) "a concentration giving complete inhibition in pure serum is probably adequate for full therapeutic effect."

The treatment was tried first on patients who would not suffer if it proved ineffective. The method of administration was as follows: a level teaspoonful of sodium bicarbonate, or of magnesium trisilicate, was swallowed with a quarter-pint of milk, and after an interval of 10 minutes the dose of penicillin was given, dissolved in 1 or 2 c.cm. saline and mixed with a raw egg. If this mixture was not thought palatable, it was further mixed with milk and sugar. Results [illegible] tonsillitis appear[illegible] of [illegible] ow being tried in pneumonia, gonorrhœa, and surgical sepsis.

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[2] Since this paper [illegible] been made, [illegible] serum after [illegible] 1 hour, and [illegible] other work [illegible] intramuscu[illegible]

SUMMARY AND CONCLUSIONS

Experiments show that penicillin undergoes a "stabilising" change during passage through the body. It becomes more resistant to heat and to alterations of pH.

Admixture of penicillin with raw egg (and to a less extent with other substances tested) makes it more resistant to heat and alterations of pH. The change produced by mixing penicillin with egg may not be the same as the change produced by its passage through the body, but the resulting resistance is of the same kind.

When volunteers were given a dose of alkali followed by penicillin in egg, the bacteriostatic activity of their blood rose to satisfactory levels. Similar results were obtained in a volunteer with hyperchlorhydria and a patient with achlorhydria.

We wish to thank Colonel H. T. Findlay, DDP, MEF, who allowed us to use penicillin for this investigation, Lieut.-Colonel H. L. Wallace and Lieut.-Colonel R. Marnham for making available patients in the medical and surgical divisions of the hospital, and Lieut.-Colonel J. M. Basset for initiating treatment in his department. Major N. F. Coghill has given us much helpful criticism and advice, and we are especially indebted to Sgt. J. M. Wilson, RAMC, who has carried out a large part of the technical work.

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AMŒBIC DYSENTERY IN EASTERN INDIA

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DYSENTERY presents one of the greater problems which confront our armed forces in the tropics. In two years I saw some 2000 cases in Eastern India, both in forward areas and base hospitals, 1000 of them having amœbic dysentery. The diagnosis of amœbic dysentery was not made unless *Entamœba histolytica* was found in the stools or typical ulcers were demonstrated in the gut, apart from a few cases of hepatic amœbiasis. Bacillary dysentery was diagnosed on the presence of the typical "bacillary exudate" in the stools (Anderson 1921, Haughwort 1924) and by sigmoidoscopy. Shortage of equipment precluded the use of cultures for diagnosis on any large scale. Cases in which the stools showed an indefinite exudate, and in which amœbiasis could not be demonstrated, are grouped under the diagnosis "clinical dysentery." Some of these were cases of healing bacillary dysentery and others of amœbiasis without or with very scanty protozoa in the stools. The proportions of the types of dysentery are given in table I.

TABLE I—TYPES OF DYSENTERY

Source of cases	Diagnostic procedure	No.	Bacillary dysentery	Amœbic dysentery	Clinical dysentery
Consecutive cases passing through CCS	One stool exam. Case evacuated to base hospital	149	27 (*18* %)	47 (*31·5* %)	75 (*50* %)
Base hospital	Stool exams. with sigmoidoscopy in few cases	380	136 (*36* %)	193† (*51* %)	51 (*13* %)
Base hospital	Sigmoidoscopy and stool exams	500*	163 (*33* %)	282‡ (*56* %)	55 (*11* %)

A few of these have been included in the second group.
† Includes 27 double infections. ‡ Includes 38 double infections.

The relative importance of the amœbic and bacillary forms is shown by the following facts: (*a*) Amœbiasis was 1½ times as common as bacillary dysentery. (*b*) The stay in hospital in cases of amœbiasis varied from a minimum of 3 weeks up to several months, usually 28 days in uncomplicated cases, whereas in bacillary dysentery the stay was 7–14 days, usually 8 days, with very rare cases requiring long periods. (*c*) The time lost from dysentery in one unit over a period of 8 months (table II) averaged 27 days in cases infected with *E. histolytica* and 2–3 days in cases not so infected. (*d*) The mortality from amœbiasis was 0·8 %, whereas no death occurred from bacillary dysentery in nearly 700 cases.

TABLE II—TIME LOST FROM DYSENTERY BY 95 MEN IN 8 MONTHS

Amœbic* infection	No.	Days off duty		
		From amœbic dysentery	Bacillary dysentery and diarrhœa	Average
Infected with *E. histolytica* ..	21	491	70½	26·8
Not infected ..	74	..	168½	2·28

* Based on the results of two stool examinations from each man, after 8 months in India.

EPIDEMIOLOGY

Both conditions appeared to be mainly fly-borne, though in amœbic dysentery relapses and the variable incubation period spread the admissions more evenly over the year. For example, in a medical unit an attempt was made to dispose of dysenteric fæces by incineration at the beginning of the monsoon. Owing to the use of wet fuel and an unsuitable "bee-hive" type of incinerator the attempt was ineffective and large numbers of flies bred in the fæcal matter running from the incinerator and invaded the cookhouse 100 yards away; 7 cases of amœbic dysentery occurred among 100 men 4–6 weeks after this disaster.

Amœbic dysentery is said to be a water-borne disease. No epidemiological confirmation of this was obtained. However, in this connexion it is worth mentioning the findings of Yorke and Adams (1926), that chlorination and potassium permanganate in the strength generally used do not kill amœbic cysts in water.

CLINICAL FINDINGS

All grades of severity were seen, from the very acute with extensive ulceration, 20–30 stools daily, fever and prostration, to the mildest of diarrhœas with traces of mucus showing occasional vegetative forms, and the man without symptoms in whose fæces the cysts of *E. histolytica* were found. The most common ty began with diarrhœa, 5–6 stools daily for 3–6 days then becoming more severe with blood and mucus 8–12 stools daily, associated with malaise, anorexi slight fever, abdominal colic, and a varying degree tenesmus. But such are the variations in sympt that the clinical picture is not sufficient to establish the diagnosis, and a detailed account of the various ty seems superfluous. Three syndromes only will b described.

1. *Extensive amœbic ulceration without diarrhœa obvious blood or mucus in the stools.*

Private A, aged 23, with a week's history of headache abdominal pain and vomiting. Constipated, except for loose motion on the day of admission. Shivering and sweatir on evening of admission. Physical examination negati apart from furred tongue and tenderness in right abdom Stool examination showed no abnormality. Blood slid malignant tertian parasites +++. Quinine gr. 30 dai For 3 days progress was normal. Further stool [illegible] were negative except for a fleck of blood on one occa On 5th day patient was drowsy; intravenous quinine gr given twice. Slight pain in RIF on coughing. On 6th severe abdominal pain of rapid onset with generalised d tension. Tender in RIF. Liver dullness reduced. Co gestion at both lung bases. Granular feeling of rectal muc and tenderness in rectovesical pouch. No blood or mucus finger. General condition very poor. Enema given with go result including some blood and mucus. Condition rapi deteriorated. Exploration considered unjustified. D followed in a few hours.

Autopsy: General peritonitis with thick fibrinopu exudate in RIF. Cæcum greatly thickened, with p of anterior wall; interior showed massive confluent amœ ulceration. Ascending colon: scattered amœbic ulcers, m extensive at hepatic flexure. Splenic flexure: greatly thickened mass size of cricket ball, inside which was a great ragged ulcer 3 inches in diameter. Descending colon: a few isolated ulcers. Sigmoid colon: many large discrete oval ulcers. Spleen enlarged, very soft, dark red. Gross œdema both lungs.

Cause of death: Toxæmia due to peritonitis following perforation of an amœbic ulcer of the cæcum. Contributed to by recent MT malarial infection.

2. *Amœbic typhlitis closely mimicking appendicitis.*—The high carrier-rate, which seems to be about 20% in British troop
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England. In
dysentery was not present clinically and the presenting symptom was pain in the right iliac fossa. It is on these cases that the following description is based.

The presenting complaint is pain in the RIF, which may be either colicky or continuous. The duration may have been weeks or days with a history of previous attacks. It sometimes comes on after meals, presumably because of the gastrocolic reflex. As a rule it is not severe, but in a few cases it is acute. Vomiting is not rare. There is often general abdominal malaise, and sometimes pain in the LIF and right hypochondrium. There may or may not be diarrhœa, with or without blood or mucus. The most difficult cases are those in which the stools are formed and without mucus. Headache is fairly common. There may be no history of dysentery or diarrhœa, but there will be a history of service in the tropics or subtropics. The temperature may be raised to 99°–100° F but is often normal. The pulse corresponds with the temperature.

Examination shows a furred tongue. There may be evidence of loss of weight, but the condition is compatible with obesity. The abdomen is not distended, though slight prominence may be detected in the RIF. There is tenderness, often guarding and sometimes rigidity in the RIF, which may be greatest over McBurney's point, but more usually is a little higher up. Occasionally it is worst low in the RIF, from involvement of the sigmoid. The cæcum is often palpably thickened; this is a valuable sign. Thickening may be found and tenderness elicited over the descending colon in the LIF. Tenderness of the liver is present in half the cases and is greatly in favour of amœbiasis. Rovsing's sign, hyperæsthesia, and a reduced or absent abdominal reflex may all be found but are inconstant.

Rectal examination may elicit tenderness on the right side high up. There is sometimes a "velvety" feel to the finger. The mucosa is often folded redundantly. There may be blood or mucus on the withdrawn finger. Examination of a stool or the result of an enema may reveal blood and mucus and amœbæ, but in a third of the cases it will be negative at the first examination. It is well to remember that a soap enema, especially if given too hot or too cold, may produce mucus from a normal bowel. Normal saline is less irritating and should be given at 100° F. The white-cell count usually shows an increase to 10,000–14,000, average 12,000, but the polymorphs are not increased relatively to the other cells, amounting to 65–75% of the total. If hepatitis is present the total count may be higher (18,000), though it may be normal and the polymorphs may retain their normal percentage. This is a valuable diagnostic point. Sigmoidoscopy will show typical lesions in about 50%.

More severe forms occur with peritoneal inflammation, perforation, and local abscess formation or general peritonitis. In these the diagnosis may be very difficult.

Two cases of amœbic typhlitis were opened under the impression that these were appendicitis. There was a plastic peritonitis in both cases, but no perforation. The abdomen was closed without drainage and recovery was uninterrupted on emetine therapy. The appendix was not removed.

Amœbic appendicitis is described in the textbooks, but I have not seen a proven case. It may complicate typhlitis, but in no case has removal of the appendix been indicated after emetine

3. *Amœbic*
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nation may elicit thickening of the cæcum and hepatic tenderness. The symptoms disappear rapidly under emetine treatment. They may be due to mild amœbic hepatitis or a reflex spasm of the pylorus from disease of the cæcum. Manson-Bahr (1939) has commented on the frequency with which duodenal ulceration follows amœbiasis. Weselmann (1942) has recovered vegetative amœbæ from the duodenum, so duodenal amœbic ulceration may be present in some cases of dyspepsia. The therapeutic test of gr. 4 of emetine in 4 days is useful.

COMPLICATIONS

Among 1000 cases of amœbiasis the complications encountered were as follows:—

Complication	%
Mild amœbic hepatitis	50
Acute " "	3·0
Hepatic abscess	2·8
Hæmorrhage (severe)	0·2
Local peritonitis (no perforation)	1·0
Perforation with general peritonitis	0·6
Perforation with abscess formation	0·2
Rectal granuloma	0·2

Hepatitis was so common that it came to be considered part of the disease. Usually it was mild—discomfort in the right h
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as some believe (Acton and Knowles 1928), or to amœbic emboli, they responded immediately to emetine. The more
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cases of miliary abscesses which would go on to true abscess formation if untreated. Amœbic hepatitis without diarrhœa and with negative stools occurred in 8 cases.

Of the 28 cases of hepatic abscess, 20 were Indians, which is an unusually high proportion (Napier 1943). Out of 700 British troops with amœbiasis, 8 developed liver abscess (1·1%). Out of 300 Indians with amœbiasis, 20 developed liver abscess (6·6%). There was one death, in an Indian whose abscess was secondarily infected with *Staphylococcus aureus*. Repeated aspiration, with emetine and sulphathiazole, was followed by drainage. The patient gradually wasted and died 10 days after operation. Autopsy revealed three large abscesses, only two of which had been reached at operation. Of the remaining 27, 3 were aspirated, and all the rest made good recoveries on emetine alone. The maximum dose given was gr. 60 in 120 days; the average was gr. 30 in 108 days.

Minor hæmorrhages were not uncommon. Severe hæmorrhage occurred twice, once in association with perforation, followed by death. The other case recovered with emetine and blood-transfusion.

Local peritonitis without perforation was recognised 10 times. Two cases were explored as already mentioned. All cases recovered.

Perforation occurred 7 times in the cæcum and once in the descending colon. General peritonitis followed in 6 cases, all fatal. In these the gut was gangrenous and too friable for effective closure. If the patient's condition allows, mobilisation and exteriorisation of the gangrenous portion is suggested, but is likely to be very difficult. Two of these cases perforated during emetine treatment, one on the fourth, one on the sixth day. Two perforations resulted in abscess formation behind the ascending colon. Expectant
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of the rectum was seen in 2 cases at sigmoidoscopy as large cauliflower-like masses resembling carcinomata. Amœbæ were found in the stools, and treatment with emetine and eusol enemata, starting with 1 oz. to the pint and working up to 8 oz. to the pint, caused the complete disappearance of the masses in two months, leaving a raw area covered with granulations which gradually healed.

DIAGNOSIS

The diagnosis rests on finding the amœba in the stools. In a few cases, especially in hepatic amœbiasis, this cannot be done. The stools must be fresh and should be examined within ¼ hour of passing. This greatly increases the number of positive results. A further increase is obtained by examining in the theatre material obtained by sigmoidoscopy.

The exudate in amœbic dysentery is not characteristic. An indefinite exudate with necrotic pus cells and degenerated red corpuscles is seen in healing bacillary dysentery. The exudate in amœbic dysentery is usually less cellular with much necrotic cell residue, but may be highly cellular with many intact pus cells. This is due to secondary infection of the ulcers, and can be distinguished from the true bacillary exudate by evidence of necrosis of many of the leucocytes, and the scarcity or absence of macrophages. Charcot-Leyden crystals are a guide, but not proof of amœbiasis. They are also found in non-specific ulcerative colitis and carcinoma coli.

By sigmoidoscopy combined with microscopy of fresh specimens an immediate diagnosis can be made in 80% of all cases. In the remainder further stool examinations are necessary. With patience and care sigmoidoscopy is safe and almost painless except for the last 3 inches, which are nearly always uncomfortable. Proctoscopy if done gently is painless and perfectly safe and is of more value than is generally realised, since 50% of cases show lesions in the rectal ampulla. There were no ill effects in the present series from sigmoidoscopy or proctoscopy. The sigmoidoscopic diagnoses are shown in table III.

TABLE III—RESULTS OF 500 SIGMOIDOSCOPIES

Type of dysentery	Cases	Positive	Negative
Bacillary	163 (*32·6*%)	160 (*98*%)	3
Amœbic (final diagnosis) ..	282*(*56·4*%)	226 (*80*%)	56†
(1) Appearance diagnostic ..	—	155 (*55*%)	—
(2) Appearance not diagnostic; diagnosis by stool exam	—	71 (*25*%)	—
Clinical	55 (*11*%)	0	55
Total	500	386 (*77·2*%)	114

* Including 38 double infections. † Diagnosis by stool exam.

I prefer not to use premedication before sigmoidoscopy unless the patient is very nervous. Coöperation is more easily obtained if the patient is in full possession of his faculties and greatly assists a painless operation. If premedication is used, full doses should be given because small doses remove the patient's self-control without greatly reducing the discomfort. The knee-elbow position was used for preference.

TREATMENT

Treatment was largely dictated by the drugs available. When the earlier inevitable shortages were overcome the following routine was adopted.

Primary case: 10–12 daily injections of emetine gr. 1, the total given being gr. 1 per stone body-weight. The injections are divided into two groups of 6 with 3 days' rest between them, to diminish the toxic effects of cumulation. And starting on the first rest day 'Carbarsone' 0·25 g. b.d. by mouth for 10 days.

This achieved a clinical cure in 50%, though the great difficulty in assessing cure and in following-up makes this figure unreliable; I think it is too high. In 40% cysts were found within 3 weeks of stopping treatment. A further course of carbarsone appeared to clear most of these; 10% required further emetine or EBI and chiniofon enemata; 2% were resistant to all treatment, from their first attack, vegetative amœbæ persisting, though there was nearly always symptomatic improvement.

Cysts will seldom reappear in the fæces until 10–20 days after treatment. Negative stools in the first 10 days prove nothing as regards eventual cure.

Relapses: The same procedure was adopted, subject to the amount of emetine already given. If three courses had been given it was felt that a further course would be unlikely to cure, so 6 injections of emetine were given if necessary to control acute symptoms, and the patient sent to special centres for the "combined treatment" (Manson-Bahr 1939)—EBI gr. 3 daily for 10 days, with chiniofon retention enemata 2½% 200 c.cm. daily for 10 days. If this had already been tried without success, invaliding was recommended and the symptoms controlled by further emetine or EBI and chiniofon.

Relapses tend to become more frequent and more resistant to treatment the longer the infection has been present. More thorough treatment of the initial attack, including the combined treatment, might reduce the number of chronic resistant cases which are distressing to see and futile to treat, though some resistant cases have been seen in which the first attack was thoroughly treated (Major Ball, personal communication).

Recently I have made a practice of giving a 4-day course of sulphapyridine 1 g. 4-hourly, or sulphaguanidine 3½ g. 4-hourly to all cases. It was of great value in allaying symptoms, even in emetine-resistant cases, and especially in those which showed a rich cellular exudate with many pus cells, though the amœba did not seem to be affected. It is too early to say whether it affected the response to emetine.

Various other drugs were tried—kurchi bismuth iodide, 'Enterosol' (4-3 iodoxy-quinoline), 'Amœbiarsan' (similar to carbarsone), 'Stovarsol,' retention enemata of eusol, silver nitrate, and 'Argyrol.' Kurchi seemed to be of little value. All the others were evidently active, but seemed inferior to the treatment described above.

TOXIC EFFECTS

Myocardial damage from excessive doses of emetine is by no means rare (Chopra and Sen 1934), and may be missed if the pulse is not examined after suitable exercise. Response to the erect position alone may be dramatic. In one patient, who was not acutely ill, the resting pulse-rate before treatment was 65–70; after gr. 34 of emetine it was 80–85; on standing up the rate rose to 160 immediately and gradually settled to 100 per min. on continuing to stand for 5 minutes. This was associated with cyanosis, breathlessness, and faintness. Personal idiosyncrasy is probably important. After 6 injections of emetine the resting pulse-rate of one patient had risen from 70 to 90. This myocardial damage is more common in relapsed cases who have had previous courses. A 3 weeks' gap should be left between courses and even then cases occur. A falling blood-pressure is an early sign. Mild cases clear in 4–6 weeks, but in a few symptoms were still present after 6 months. It does not appear to be generally realised that EBI can contribute to the cardiac damage, though it is less liable to do so than emetine.

Diarrhœa towards the end of a course of both emetine and EBI is not uncommon and must not be interpreted as a relapse of dysentery; it is a toxic effect of emetine and further emetine will aggravate it. I saw no case of neuritis.

DIET

It was often impossible to arrange for the diet recommended in the textbooks, especially in forward areas. Fortunately diet seemed to make very little difference. My final conclusion was that maintenance of good nutrition and attention to the vitamin intake, especially the B group, was more important than the need for a low-residue diet. Provided "pips and skins," coarse vegetables, spices, and alcohol were avoided, further restrictions seemed of little value.

RESULTS

The results can only be estimated, since the majority of cases could not be followed up, and the assessment of cure is uncertain.

Results	*Cases* (%)
Clinical cure	33
Improved with occasional relapses (some of these would be reinfections)	33
Frequent relapses	28·2
Resistant cases	5·0
Death	0·8

All will agree that these are very disappointing figures. As already urged by Leishman and Kelsall (1944), there is grave need for new and more efficient drugs in the treatment of this disease.

SUMMARY

Of 2000 cases of dysentery of all types seen in Eastern India in 2 years, 1000 were amœbic. Amœbic dysentery is a much longer and graver disease than bacillary dysentery in that area.

Examples are given of extensive amœbic ulceration without diarrhœa or obvious blood in the stools; of amœbic typhlitis closely resembling appendicitis; and [illegible] amœbiasis.

[illegible] over half the cases of amœbic [illegible] in 2·8%.

[illegible] in the stools is facilitated by examining a stool within ¼ hour of its being passed, and by examining in the theatre material obtained by sigmoidoscopy; by these means an immediate diagnosis can be made in 80% of cases.

Injections of emetine, plus carbarsone by mouth, produced clinical cure in about half the cases of amœbic dysentery.

The sulphonamide drugs exert a favourable clinical effect, but do not eliminate the amœba.

Inadequate treatment of the initial attack predisposes to the resistant form of the disease.

My thanks are due to the Consulting Physician, War Office, for permission to publish this paper; to Colonel G. Taylor, IMS, and Lieut.-Colonel M. H. P. Sayers, RAMC, without whose enthusiasm these figures would never have been collected; to Major N. S. Martin, H. Maitland, F. Pickard, and [illegible] and Major M. Denness, IMS, for case-sheets; [illegible] Parker, RAMC, for the post-mortem report; and to the many medical officers who have assisted me in other ways; finally to Dr. Margaret C. Payne for her advice and criticism, and Major M. Ball, RAMC, for information about cases returned to England.

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RETURN OF THE BLOOD TO THE HEART

A CRITICISM OF THE ORTHODOX VIEW

FF. ROBERTS, M D CAMB.

TWICE recently THE LANCET has drawn attention to the mechanism of the return of blood to the heart. An annotation of Dec. 11, 1943, read:

> "It has long been taken for granted that during muscular exercise the veins must be subjected to a pumping action by the muscles which, in virtue of the valves in the veins, are able to augment the inflow of blood to the right auricle."

Only six weeks later (Jan. 22, 1944) appeared a leading article on the same theme with its bearing on pathological conditions. The juxtaposition of these references shows how fundamental is the problem and how much still remains to be learnt about it.

Orthodox teaching on the subject may be gathered from the following extracts taken from standard textbooks.

> "In exercise the return of blood is facilitated by muscular movement itself, which compresses the capillaries in the muscle itself and also to some extent the valved veins."
>
> "During muscular contraction, blood is squeezed out of the muscles and is forced towards the heart. When the muscles relax, blood is free to enter only from the arterial side, because reflux through the veins is prevented by their valves."
>
> "Every muscle, as we have seen, acts as an accessory heart, the muscular contractions emptying the capillaries into the veins and in the latter driving on the fluid towards the heart in virtue of the valves present in these vessels."

But it is not only in exercise that the aid of the muscles has to be invoked. The effect of gravity presents the same problem.

> "In the feet the capillary pressure is normally prevented from attaining very high values, owing to the presence of valves in even the smallest veins, and to the occurrence of constant small muscular movements, which by forcing blood along the veins, enables them to act as a pump."
>
> "The pressure in the veins of the foot is but little higher than that in the veins of the hand (L. Hill). When a man assumes the upright position, the arteries of the leg and foot contract until, under the combined influence of the heart's contraction and gravity, the blood-supply to the capillaries is just adequate. The return of blood from the dependent parts cannot be ascribed entirely to the heart beat but is largely due to the contractions of the muscles of the limb, which press on all the deep and superficial veins, and in virtue of the valves force the blood contained therein past Poupart's ligament into the abdomen. This explains why it is so difficult to stand for any length of time without moving, and emphasises the need of moderate exercise for the maintenance of a normal circulation."

Yandell Henderson (1943) "cannot resist the impression" that Harvey recognised that vigorous contraction of the muscles propels blood along the veins. In point of fact Harvey did entertain this view very definitely. In the first Disquisition written in reply to John Riolan's *Enchiridium* he says:

> ". . . by the impulse of the blood which is forced with each stroke into every part of the second and third region, that which is contained in the pores or interstices is urged into the smaller veins, from which it passes into larger vessels, its motion assisted besides by the motion and pressure of circumjacent parts; for from every containing thing compressed and constringed, contained matters are forced out. And thus it is that by the motions of the muscles and extremities, the blood contained in the minor vessels is forced inwards and delivered into the larger trunks."—(Willis's translation, 1847, p. 97.)

and in *De Motu Cordis* he says:

> ". . . it is forced from the capillary veins into the smaller ramifications, and from these into the larger trunks by the motion of the extremities and the compression of the muscles generally."—(*Ibid*, p. 71.)

That Harvey should have held this belief is surprising in view of his firm adherence to the Aristotleian theory of the sovereignty of the heart.

> "It is absolutely necessary to conclude," he says, "that the blood in the animal body is impelled in a circle, and is in a state of ceaseless motion; that this is the act or function which the heart performs by means of its pulse; and that it is the sole and only end of the motion and contraction of the heart."—(*Ibid*, p. 68.)

The theory of the pumping action of the muscles is therefore as old as the discovery of the circulation. Yet in spite of its disti[illegible] of those who have [illegible] at the present d[illegible] fallacies in the reasoning adduced in its support.

THE PRESSURE GRADIENT

A pump is defined as a machine for raising fluid from a low to a high pressure or level. Since, as is universally admitted, the pressure falls from arteries to capillaries and from capillaries to veins, the muscles cannot come within this definition. Nor can they exert any accelerating effect unless they actually suck blood from the arteries—a view which, so far as I know, has never been entertained. In our childhood we have all made channels in the sand and have attempted to push already running water along with our spades only to find to our disappointment that this has no effect. As the channel cannot pass on more water than it receives so the muscles cannot eject from the blood-vessels in and around them more than these receive from the arteries. The blood-flow is no greater than if the muscles remained passive.

THE EFFECT OF GRAVITY

The estimation of venous pressure under living conditions has led to the most discordant results (Eyster 1929), showing either that the venous pressure varies considerably in different individuals or that the methods themselves introduce some disturbing factor. The circulation must however be subject to the laws of gravity and hydr[illegible] all the vessels of the feet in the [illegible] arteries, capillaries, or veins—[illegible] must be added to the pressure [illegible] If, as we learn above, the arteries contract when the subject stands this only reduces the quantity of blood reaching the feet; the pressure remains unaltered. The pressure in the veins must exceed the hydrostatic pressure due to the [illegible] of the limb, otherwise the blood would never [illegible] the heart, and this would be equally true if the blood had to be pumped up by the muscles. Moreover, the statement made by more than one writer that muscular movements keep the venous pressure low is absurd.

It is interesting to note that where gravity operates in favour of the veins these are given an entirely different function, for according to one standard work:

> "The capillary pressure in the blood varies with the position in reference to the heart from 30 cm. to 4 cm. H_2O. The reason is that the veins collapse and restrict the flow. The capillary pressure is always maintained at a positive value."

This surely is an entirely novel function to ascribe to the veins, the prevention of a negative pressure in the capillaries. What is wrong with the straightforward view that the normal positive capillary pressure is due to the heart-beat?

THE VALVES OF THE VEINS

The valves in the veins are regarded as an integral part of the pumping mechanism, more particularly in overcoming the effect of gravity. Structurally they form the only feature which this mechanism possesses in common with a pump as we know it. To a pump a valve of some sort is essential, and if the muscles together with the veins form a pump the valves in the veins must work efficiently. But in some veins the valves are known to be incompetent. Furthermore, the statement, quoted above, that valves are present "in even the smallest veins" is anatomically incorrect. It is generally agreed that the flow along the veins is continuous. *Eppur si muove.* This being so the valves clearly cannot operate; for if they opened and closed, the stream would be intermittent. Moreover, in order to make the stream intermittent in the veins where the valves are chiefly to be found, the pumping strokes of the muscles drained by these veins would have to be synchronised.

The valves clearly have no such function. Harvey realised what many modern writers fail to realise, that the valves have nothing to do with gravity. Their true function has never been better expressed than in his words:

> ". . . the veins, in short, as they are the free and open conduits of the blood returning to the heart, so are they effectually prevented from serving as its channels of distribution, from the heart."

In other words they exist to ensure that blood entering a main channel from a tributary must move towards the heart.

TONIC CONTRACTION

But even allowing the possibility of a pumping action during exercise, how does this take place during rest? Henderson, to whom the muscles are "tonic booster pumps," is driven to the assumption that tonic contraction takes place by contraction of different groups of fibres in rotation. But as THE LANCET points out, this hypothesis was disproved by Denny-Brown (1929) and also over sixty years ago by Gaskell (1878) when he showed that the circulation was maintained after tonus had been abolished by curare.

A further argument used is that when muscular movement is absent or reduced to a minimum the circulation fails. Men, it is said, cannot stand still for a long period because of the resulting stagnation of blood in the veins. But men can stand up for several hours, and if they indulge in minor changes in position it is difficult to see how such small movements have a substantial pumping effect. Nor is there any evidence that such movements are the instinctive response to blood stagnation, for there are several other possible factors such as the pressure of the feet against the ground and fatigue in all the joints. Even granting that prolonged standing throws a strain on the circulation, prolonged sitting is the daily fate of a large proportion of the human race. Yet the hydrostatic pressure on sitting is only less than on standing by the length of the thigh, and is about 60 cm. H_2O.

Hill, Barnard and Soltau (1897) state that—

> "whilst the limb is maintained in a dependent and immobile posture, the veins slowly distend and the tension within them, revealed by the finger to be rising very constantly. Normally during the constant activity of limb and muscles the veins at no time exhibit such tension. Therefore it is by the constant compressive action of the skeletal muscles and the change of limb posture that the blood is returned from the veins in the extremities."

That the veins become engorged when a limb hangs down no-one will deny, but that they become less distended when the limb becomes active is a statement whose truth can be challenged. It certainly does not agree with my experience. Moreover, why is constant activity more "normal" to limbs than the resting position which, in a great many people, they occupy for far longer periods?

THE PUMPING EFFICIENCY OF THE MUSCLES

The volume of blood returning from each human leg at rest is about 0·5 litre per min. During exercise it is of course several times more. If this is, as we are told, "largely" due to muscular contraction the muscles perform a truly formidable task and must possess hydraulic efficiency of a high order. That they should possess it is even more remarkable since such pumping could only be a subsidiary function of muscle tissue. But as regards the superficial veins it is difficult to see any signs of efficiency, since these can only be compressed between the muscles and the skin, and the skin is a very yielding structure. As regards the vessels lying within and between the muscles it has to be assumed that the muscles form a kind of sponge (Raciborski 1841). But if this were the case it would follow logically that during prolonged contraction a muscle must become ischæmic.

To sum up: when one reflects that by an action whose mechanical efficiency is doubtful the muscles perform a secondary function of "pumping" from a high to a low pressure under circumstances which make the valves inoperative; and that it is necessary to postulate (1) the existence of valves where they are known to be absent, (2) small movements which have never been demonstrated, (3) a mechanism of tonic contraction which has been disproved, and (4) the inability of the human body to do what it clearly can do—when, I say, one reflects on these things, one may be forgiven for hesitation in accepting the theory.

VENOUS PRESSURE AND THE OUTPUT OF THE HEART

It is a corollary of the theory which we have discussing that the increase in venous pressure produced causes an increase in the cardiac output. full implication of this view is not fully realised. Excep in so far as it responds to the higher centres, the is degraded into an almost passive organ whose funct is merely to raise blood from a low to a high pressure blind obedience to the requirements of the muscles expressed by the ability of these muscles to supply with blood. The heart in fact is little better a donkey-engine. But even the faithful find it hard hold this view consistently. One writer, after saying the orthodox manner that "the output of the he depends upon the venous inflow," later remarks th "increased efficiency of the heart causes a fall of ven pressure." The two statements are of course contradictory. Either venous pressure influences the heart the heart influences venous pressure; they cannot bo be true.

That the stroke-volume of the heart depends venous pressure is held to have been proved by Patte Piper, and Starling (1915) on the heart-lung preparatio This experiment is however open to serious object There is the absence of the restraining influence of t pericardium. Then there is the wide range of fluctuat artificially produced in the venous pressure.

Venous pressure mm. H_2O	*Output of heart c.cm. in 10 sec.*
95	86
145	140
55	33

It is to say the least doubtful whether such alterati venous pressure measured at the entrance of the inf cava into the heart can possibly occur under physiolog conditions. In 1924 I demonstrated that the accel tion in the passage of blood which is said to be produ by muscular contraction could be imitated by making a short-circuit between the abdominal aorta and inferior vena cava. When this was done the arterial pressure of course fell considerably, but there was no appreciable rise in the pressure of blood entering the heart. This is only what was to be expected from our knowledge of the great distensibility of the veins.

THE BAINBRIDGE REFLEX

Bainbridge (1915) claimed to have proved that increase in venous pressure caused a reflex quickening of the heart, the afferent path being the vagus and the efferent path being mainly the vagus and also possibly the sympathetic. The grounds
are dubious, to say the le
produced by the intravenous
dog in amounts ranging be
occ

., the venous pulse rose from to 100 mm. H_2O and the pulse-rate from 80 to 100. This result was confirmed in the cat by Sassa and Miyazaki (1920) using the same method. Anrep and Segall (1926) also claimed to have confirmed it but it is difficult to reconcile this claim with their statement "that in several cases the Bainbridge reflex was observed with no rise in venous pressure," and with their conclusion that "it is premature to regard venous pressure as being responsible for the reflex." Moreover, DeGraff and Sands (1925) observed the effect in one-third of their

th vagi. In view of the
Bainbridge's

workers, it seems highly q
result proves that a corresponding mechanism comes into operation during exercise. Yet this belief, so poorly attested, finds an established place in modern teaching.

CONCLUSION

In view of the passages which I have quoted it is only fair to say that I myself (Roberts 1920) have echoed in the main the thesis which I here criticise. But that was a quarter of a century ago and the years have made me more sceptical.

It is peculiarly difficult to discuss this subject without arguing in a circle, perhaps because the subject concerns a circle and a moving circle at that. However this may be, the fact remains that at whatever point in the circle one begins, one must think of what is happening behind it as well as what is happening in front of it. There would be some force in the pumping argument if the muscles pumped from a sump of variable content like the oil sump of a motor-car. But obviously the muscles can only pump into the veins exactly as much as they receive directly from the arteries. The advocates of this theory appear to me to be considering only the forward effect of the pumping action upon the veins and right side of the heart, ignoring the fact that such forward effect must be accompanied by an exactly corresponding backward effect extending through the arteries to the left side of the heart.

The theory, it seems to me, rests on unproved hypotheses, leads to many inconsistencies, runs counter to the law of gravity and the laws of hydrodynamics, and creates more problems than it solves. One wonders whether, if the matter were thoroughly explored, a simpler explanation could not be found in the thesis that the heart is the sole motive force of the circulation, being capable unaided of driving the blood, through arteries, capillaries, and veins, back to itself whatever the needs of the body.

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PENICILLIN IN WEIL'S DISEASE

R. M. CROSS, LRCPE

SQUADRON-LEADER RAFVR

AN airman, aged 35, was admitted to a RAF hospital complaining of sore-throat, headache, and pains in the back and legs, of 3 days' duration. Temperature 100° F; pulse-rate 130 per minute.
was very hyperæmic, and the
of the throat gave a profuse
streptococci on culture. Tota
18,000 per c.mm. (neutrophils 79%, eosinophils 1%, basophils nil, lymphocytes 17%, monocytes 3%).

During the next 2 days generalised muscular tenderness was very pronounced, and on the fifth day of illness he had an epistaxis, slight jaundice developed, and a few purpuric spots were noticed on his upper chest. BP was 120/70 mm. Hg, and the urine showed a heavy cloud of albumin, bile positive, with spun deposit of bile-stained granular casts, few polymorphs, and many red cells; culture was sterile. A tentative diagnosis of Weil's disease was made, and 5 c.cm. of his blood were inoculated intraperitoneally into a guinea-pig. Serum was also sent to the Wellcome Research Laboratory for agglutination reactions.

Over the next 4 days the jaundice became deeper, and the man's general condition deteriorated; he had persistent hiccup, and vomited bile-stained fluid frequently. The serum-bilirubin was 12·5 mg. per 100 c.cm., and the blood-urea rose to 320 mg. per 100 c.cm. Lumbar puncture revealed bile-stained fluid under normal pressure; cells 5 per c.mm., protein 40 mg. per 100 c.cm., globulin no increase, chlorides 760 mg. per 100 c.cm., gamboge no change, Lange no change, WR negative, and Van den Bergh gave an immediate direct positive reaction.

Treatment with *Lepto*
was given
intraveno
larly. A
of serum was given, but his condition was still serious, and at times he was delirious and incontinent.

Up to this time
was one of
examination
the urine sho
ing *L. icteroh*
The guineapig, which had been inoculated with blood taken on the fifth day of illness, died 10 days after inoculation, autopsy showing well-marked jaundice and multiple hæmorrhages in the lungs. Leptospira were identified by dark-ground examination of the urine.

The diagnosis now being definitely established, it was decided to try a course of penicillin, and a slow intramuscular penicillin drip was put up on the fourteenth day of his illness. After 24 hours, during which he had received 120,000 units of sodium penicillin, no leptospira could be demonstrated by dark-ground illumination of the urine. By this time the following positive result of agglutination was received, representing serum taken on the fifth day of illness: 1/10 trace, 1/30 positive, 1/100 positive, 1/300 trace, further dilutions negative.

The patient gradually improved, and his convalescence was uneventful apart from a hypochromic microcytic anæmia (Hb. 9·5 g. per 100 c.cm., red cells 3,710,000 per c.cm.). The blood-urea returned to normal 10 days after penicillin treatment had been begun. The total amount of penicillin used was 800,000 units extending over 7 days.

To estimate the effect of penicillin on *L. icterohæmorrhagiæ*, two guineapigs were inoculated intraperitoneally with the urine containing the leptospira from the original dead animal, the presence of which was confirmed by dark-ground illumination; 6 days later one of the animals was given intramuscular penicillin, 3 c.cm. twice daily (500 units per c.cm.), for 4 days. On the tenth day the animal which had not been given the penicillin died, and autopsy revealed well-marked jaundice, hæmorrhages in the lungs, and leptospira in the urine, seen by dark-ground illumination; whereas the treated animal survived and showed no ill effects.

SUMMARY

A case of Weil's disease, of such severity that life was endangered, was treated with *Leptospira icterohæmorrhagiæ* antiserum and penicillin, and slowly recovered.

Leptospira were found in the urine 3 days after serum treatment, but after 1 day on penicillin no leptospira could be found.

In experimental infection of two guineapigs with active *L. icterohæmorrhagiæ*, the one treated with penicillin survived, whereas the other died in 10 days showing typical post-mortem appearances of Weil's disease.

Preliminary Communications

TRANSMISSION OF INFECTIVE HEPATITIS BY FÆCES AND URINE

DURING the past eighteen months a number of attempts has been made to transmit infective hepatitis by fæces and urine fed to volunteers by mouth. Though the investigations are being still continued there appears to be sufficient evidence to warrant the following conclusions. The causal agent of infective hepatitis is present in both the fæces and urine of persons suffering from the disease. and (at any rate in the fæces) it is present in a filtrable form.

Of six experiments with fæces from different patients in the early stages of infective hepatitis, within the first five days of jaundice, three have been positive. In these three positive experiments, of eighteen volunteers given fæces emulsified in milk by mouth seven developed symptoms of infective hepatitis in from 17 to 28 days: six of the eighteen volunteers were given a Seitz filtrate of stools by mouth, and two were positive.

Of six volunteers given urine by mouth from a patient with infective hepatitis, who also provided a positive fæces, three became infected.

While there is much epidemiological evidence to suggest that intranasal transmission through infected droplets is one method of infection, the excretion of the agent of infective hepatitis in the fæces and possibly urine shows that contamination of food and water and transference by flies may offer a more plausible explanation for the fulminating outbreaks occasionally encountered among both civil and military populations.

G. M. FINDLAY,
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Reviews of Books

An Introduction to Physical Methods of Treatment in Psychiatry

WILLIAM SARGANT, MB CAMB., MRCP, DPM, deputy clinical director, Sutton Emergency Hospital; ELIOT SLATER, MD CAMB., MRCP, DPM, clinical director, South Eastern Hospital. (Livingstone. Pp. 171. 8*s.* 6*d.*)

IN spite of the widespread adoption of physical methods of treatment in psychiatry since Wagner-Jauregg's great discovery, there has not been available to the psychiatrist any practical vade-mecum detailing the indications and technique of all these procedures. The want is met by this "introduction," which, without the usual apparatus of references and quotations, gives what in the authors' experience are the right lines on which physical treatment should be carried out. The book is frankly didactic.

Those whose memories extend to earlier decades may feel some concern lest new methods, however skilfully applied, may be too freely recommended. On the use of prefrontal leucotomy the authors quote the findings of Freeman and Watts, Hutton and Fleming, that two-fifths of the schizophrenics treated showed good results; also two-thirds of the depressives and four-fifths of the obsessional neurotics. They add that the number of obsessionals treated is small, and the results though encouraging must therefore be taken with caution.

> "A good result obtained by leucotomy in a severe chronic obsessional is likely to be permanent, there can be no guarantee of non-relapse after the insulin treatment of schizophrenia, the convulsion treatment of depression, and still less after the psychological treatment of the neurotic."

This statement, which is unbacked by statistics, seems to depend on the fact that leucotomy produces an irreversible change by permanently damaging the brain. The changes in the patient's behaviour, they admit, depend on the extent of the damage done, and include with good effects some which are less endearing. The temper may be more hasty, and there is less sense of its social consequences; the patient may become more exacting and imperative, less capable of sympathy with others, and lacking in self-criticism, though willing enough to criticise his environment. Furthermore there may be damage to the personality where its good qualities have depended on obsessional drive and persistence. The authors point out that the skill of the psychiatrist is required to ensure that the operation is not done on patients where these undesirable effects—to be expected in some degree in all patients—will have serious consequences.

More detail of the indications and the counter-indications of the physical methods so excellently described would have been welcome. The development of the physical treatment in psychiatry must depend on the growth of the psychological aspect: psychiatry is indivisible. As the book stands it is a *statement* of physical methods rather than an introduction to them, but it is a good statement. By its persuasive confidence in the efficacy of such treatment it will doubtless lead to a wider appreciation of the need for weighing up all the therapeutic resources before abandoning any psychiatric patient as a "hopeless chronic."

The authors have provided in an opening and a closing chapter a fair view of the wider framework within which the physical methods must have their place if they are not to be falsely aggrandised and misused.

Intracranial Arterial Aneurysms

WALTER E. DANDY, MD, FACS, adjunct professor of neurosurgery, Johns Hopkins Hospital, Baltimore. (Comstock Publishing Co. Pp. 147. $2.50.)

IN this thoroughly practical work on intracranial aneurysms Professor Dandy is not much interested in the nuances of the clinical pictures. This book, like others from his pen, is strongly individualistic: his forte is his courage and technical ingenuity in carotid ligations. He can now claim that his method of placing a silver clip on the carotid artery intracranially, just above th point where it pierces the dura, is a reasonably sa measure. He has done it thirty times and only once di hemiplegia result, and he believes this operation to b less dangerous than the tying of the internal carotid i the neck. A review of anomalies of the circle of Will is illustrated by ingenious schematic drawings, but th information given in this chapter is more useful to explai disasters than to help the surgeon to prevent them. Th author's respect for the dangers of angiography are i contrast to his unconventional attitude elsewhere.

The variable behaviour of intracranial aneurysms pu them among the most uncertain of surgical problem Professor Dandy's account, though a milestone on th road, is not the final one.

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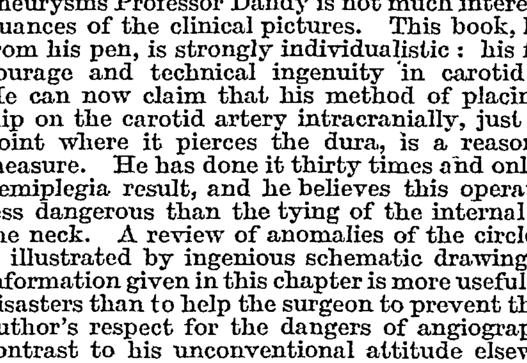

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THE LANCET

LONDON: SATURDAY, FEBRUARY 17, 1945

Ætiology of Infective Hepatitis

IN 1915 a considerable proportion of sickness in the Mediterranean Expeditionary Force was caused by a form of epidemic jaundice clinically identifiable with the condition now called "infective hepatitis." Much attention was given to the disease by hygienists, clinicians, and bacteriologists, and though its ætiology remained obscure they agreed that it was a product of the insanitary conditions associated with the campaign. It was in fact generally attributed to a specific infection introduced via the alimentary tract and mainly spread through human excreta. Moreover, a close association in incidence with dysentery was noted, and its prevalence in forward areas and base camps heavily infested with flies suggested transmission from fæces by these vectors. A paper by Lieut.-Colonel Raymond Kirk published in our issue of Jan. 20 shows that similar conclusions have been drawn in the Middle East during the present war. His account of the hordes of flies at Alamein which "swarmed over everything," and presumably conveyed the infection to men who were unable to protect their food, mess-tins, mouths, and hands, is all too reminiscent of conditions in the Eastern Mediterranean thirty years ago.

One reason why the causation of infective hepatitis as not been cleared up sooner is that animals generally are not susceptible to the disease; and satisfactory experiment has been possible only with uman volunteers. Reviewing such work about ighteen months ago[1] we referred to the claim of Oegt[2] in Germany that he had transmitted the nfection by injection of serum and by oral administration of duodenal fluid and urine, and we mentioned he work of Cameron[3] in Palestine which suggested he presence of a specific agent in blood and serum. lready Findlay and Martin[4] had produced jaundice by intranasal instillation of nasopharyngeal vashings from men who had developed hepatitis after noculation against yellow fever. Hepatitis caused y yellow-fever vaccine (containing human plasma), nd other forms of "serum jaundice," correspond losely to epidemic jaundice, though their incubation eriod has usually been longer—e.g., 60–100 days nstead of about 30 days—and their complete identity perhaps still debatable. A further important step as recorded by MacCallum and Bradley[5] working r the Jaundice Committee of the Medical Research ouncil. They described transmission of the disease administration of materials from early cases; t in their experience frank jaundice resulted only en serum was injected subcutaneously or when ces were sprayed into the nose and pharynx. ey found, however, that a "subicteric" condition ulted from the spraying of the nose and throat with nasopharyngeal washings. The special importance of their work lay in the demonstration for the first time of a causative agent in fæces; from which the question of course arose whether administration into the nose and pharynx led to infection through the mucous membranes of these passages or via the alimentary tract.

Previously, in 1942–43, a detailed scheme for similar experiments had been prepared in the Middle East by Major C. E. van Rooyen and others, and as Professor Witts, chairman of the Jaundice Committee, has pointed out,[6] this scheme would have been carried out in 1943 if the authorities had not refused permission to use military volunteers in such experiments. However, the plans made in the Middle East were eventually fulfilled by other means, and this week we publish a paper in which Major Havens of the Medical Corps of the US Army, Professor Paul of Yale University, and Major van Rooyen describe transmission experiments made in the United States with materials obtained in 1943 from infected American and British troops in the Middle East. The presence of an infective agent in fæces, inoculable by feeding in gelatin capsules, was clearly demonstrated. Summarising the results of their own experimental work and that of others, the authors conclude that the virus or infective agent is in the fæces and that the disease can be reproduced by feeding such material or by spraying into the nose and pharynx. They show also that it is reproduced by feeding serum from cases, and point out that the incubation period in this type of experiment is about 28 days—i.e., shorter than the period in "serum jaundice." A preliminary communication on p. 212 from Brigadier Findlay and Major Willcox, reporting further experiments on hepatitis, carried out in West Africa, indicates that the causal agent is present in both fæces and urine, and in the fæces in a filtrable form.

Thus we now have a fairly definite picture of the ætiology of epidemic jaundice, confirming ideas dating back to 1915. The infection is a specific one; the causative agent, probably a filtrable virus, invades the body through the alimentary tract, is present in the intestinal contents and in the blood, is discharged in the fæces and possibly also in the urine, and can be transmitted by materials contaminated from an excretal source or by flies. Whether the virus is also set free from the body in the nasopharyngeal secretion and spread in this way, invading again through the mucosa of the nasopharynx, remains an open question; but it is at least doubtful whether such a mechanism of infection need be postulated in the epidemic disease. Of course much work remains to be done before the virus and its special characters are fully defined; and, as mentioned above, the failure generally to transmit the infection to animals is an obstacle to isolation and study of the virus, and prevents the practical applications that might result from its isolation. The important problem of "serum jaundice" and its relation to the epidemic disease is one that calls for further examination, as does the associated problem of unrecognised carriers or latent cases of infection.

While epidemic jaundice has been a conspicuously prevalent disease of various military campaigns in different parts of the world, the same infective hepatitis, occurring in sporadic form or in limited groups of cases, and long spoken of as "catarrhal jaundice," is by no means a negligible infection among civil populations. The results of research indicating an excretal source of infection are therefore significant to those concerned with public health.

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Trench Foot

IN the course of this war tissue damage caused by long exposure to low temperature has appeared in a variety of forms. It is probable, but not yet certain, that "trench foot," "immersion foot," "sea-boot foot," "lifeboat leg," and "shelter foot" are all different varieties or intensities of the same condition. A satisfactory comprehensive term has not been suggested, although "peripheral vaso-neuropathy after chilling"[1] is scientifically accurate. As control of the U-boat menace has improved, the incidence of immersion foot has diminished; but with the Allied armies now fighting under wretched conditions on the Western Front reports of trench foot are coming in, though British troops seem to be remarkably immune. In the early winters of the last war trench foot was a major cause of disability, but after the institution of effective preventive measures it was almost unknown by the winter of 1917–18. Trench warfare offered all the conditions for the development of the disorder, and it is not surprising that with modern mobile warfare the incidence should be low. Even today however there must be many circumstances in which men are compelled to spend hours or days in cramped conditions and exposed to cold and wet. Thus last winter trench foot occurred in the Fifth Army in front of Cassino, and doubtless cases are again being encountered in Italy as well as on the Western Front.

Cold insufficient to cause tissue freezing, usually associated with damp, is the essential extrinsic factor. For this reason the incidence of trench foot is always greatest during periods of thaw. Muscular and circulatory inertia are the intrinsic factors. THOMPSON[2] points out that Canadian lumbermen spend long periods exposed to cold and wet but do not suffer from trench foot because they are constantly using the muscles of the lower limbs. For a similar reason the British Tommy, who swears and stamps around when he is cold, suffers less than some of his more resigned allies. Tight puttees and the sharp edge of the fire-step were incriminated in the last war, for any constriction of the lower limbs will favour circulatory stagnation. Once the feet start to swell, boots may constrict, and even wet matted socks may restrict toe movements. Individual susceptibility to cold may also be a factor; many authorities believe that those who have naturally cold sweaty feet are more liable to trench or immersion foot. Certainly a previous exposure to severe cold makes the feet more susceptible.

The condition is insidious in onset. The feet are cold and numb, and in severe cases the sufferer may be unable to stand. When boots are removed the feet are pale or mottled and swollen. After removal from the cold environment swelling may increase and blistering may occur. The full account of trench foot in the history of the last war[3] does not contai a clinical description corresponding to the thre phases (prehyperæmic, hyperæmic, posthyperæmic which UNGLEY and his co-workers[1 4] describe a the cardinal features of immersion foot. But pai is a prominent feature of both conditions—a deep seated burning or throbbing pain of constant intensity and also attacks of sharp, shooting pains like the lightning pains of tabes. It has been suggested that these pains are the result of anoxia of sensory nerve-endings. Objective disturbances of sensation, usually of sock or carpet-slipper distribution, become apparent and may persist for long periods. Gangrene ensues in severe cases but is usually superficial. In trench foot environmental conditions make i incidence of sepsis higher than in immersion foot, tetanus is a real danger—it was the cause of many deaths in the last war before antiserum was used as a routine. Whether the cold-sensitive state hyperhidrosis, and delayed pains which are s constant sequels of immersion foot also follow tren foot remains to be seen.

It is to be hoped that any opportunities for studying the pathology of trench foot will not be mi In 1915–16 the experimental work of LORRAIN S RITCHIE, and DAWSON[6] provided a pathological bas In this war, BLACKWOOD[7] has been able to correlat experimental work on immersion foot with in human biopsy and amputation material H finds that the chief incidence of the damage is t be observed in muscle and nerve, and that bloo vessels, except those adjacent to gangrenous infected tissue, are normal. This is at varia with the findings of the previous observers, wh considered damage to the walls of the small blood-vessels to be the change of primary importance. Around these findings centres the problem of pathogenesis. One hypothesis, based largely on LAKE work with tissue cultures, is that tissue damage is result not of the low temperature per se, but of unbalanced metabolism during the periods of chillin and warming, and of pressure on nerves and bloo vessels by the excessive exudation that warmt produces. A more recent conception is that damage is done during exposure and that it attributable to the direct effects of cold and isc Cold constricts the arteries and arterioles but the minute vessels, and stasis results; orga vascular occlusion need not be postulated.

"It has been established beyond dispute th trench foot can be prevented, and if the princip of prevention are grasped and the details carried with thoroughness and energy success is assured thus the *Official History*[3] of the last war. This t the British and Russian armies seem to have profi by the experience of 1914–18 and adopted effici prophylactic measures. The principles of preventi are: keep the feet warm, clean, and dry; maint general fitness and a high morale. To this end t correct planning and architecture of trenches a

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dugouts, the supply of dry socks, dry rubber boots, and hot food to troops in exposed positions, the prevention of inertia, and insistence on proper foot-drill are the main essentials. The value of rubbing the feet with oil is undecided; in the last war the general conclusion was that it was an accessory but non-essential measure, and that as much good resulted from the rubbing as from the presence of the oil. With regard to immersion foot, the opinion [illegible] than good may result from massage, [illegible] es tend to become friable and are [illegible] In the early stages before there is [illegible] gentle rubbing is probably beneficial [illegible] ay have some slight insulating effect. The prevention of trench foot depends on good discipline and good organisation, and it is significant that preventive measures are the responsibility of platoon officers, not medical officers.

The treatment of established trench foot is still controversial. There seems no doubt that rapid [illegible] extremities is bad; the question [illegible] not to cool. Those who advocate [illegible] hat by so doing a balanced meta- [illegible] but neglect LEWIS's observation[9] [illegible] C is harmful to tissues. No-one [illegible] ies that once the feet have become hyperæmic cooling even with ice may have a therapeutic value for the relief of pain; but when this is done the tissue temperature does not fall below 21° C, the optimum temperature for protracted therapeutic cooling.[10] To keep the feet clean, dry, elevated, and exposed to an equable room temperature while the trunk and arms are kept comfortably warm under blankets appears to be a logical and satisfactory procedure. In most cases the feet become hyperæmic as a natural reaction to their exposure, and there is no need to accelerate the process by *sympathectomy*, *reflex vasodilatation*, or vasodilator drugs. The necessity for the administration of antitetanic serum, and, if gangrene develops, for surgical conservatism, are two lessons of the last war that have been reaffirmed in this.

Penicillin by Mouth

THE ease with which the sulphonamides can be administered by mouth has set a high standard for chemotherapeutic drugs, refined even to the point at which the varying degree of absorption of the different sulphonamide compounds from the intestinal tract has been used to enlarge their therapeutic range. Penicillin, a highly soluble substance, is also absorbed from the intestine, as the earliest experiments at Oxford[11] showed; but there the similarity ends, for while the one type of substance is relatively stable the other is destroyed by, among other things, acid, and the enzymes of species of bacteria commonly found in the lower bowel. The difficulty therefore of getting the penicillin unchanged to the site of absorption is great. Further, it is by no means certain that apart from these pitfalls the process of absorption from the intestine may not involve some loss which does not occur after parenteral administration, since a smaller proportion of the amount administered is usually recovered in the urine if it is given by mouth than if given parenterally. These considerations, together with the scarcity of the drug, led the Oxford workers to recommend parenteral administration, a recommendation which up to now has been universally accepted, in spite of the fact that, as GARROD[12] has said, parenteral treatment must be "arduous for those in charge and disagreeable for the patient." This complexity of administration has at least ensured that the great majority of patients receiving penicillin have been treated in hospitals under conditions ideal for laboratory investigation and control. Thus a body of scientific knowledge has been built up such as is rarely gained with a new drug of wide applicability, and which vastly increases and will increase its value.

Although the parenteral route was established early on as the one of choice in penicillin therapy, some information about the behaviour of the drug in the alimentary tract has been accumulated. In 1940, among their first published observations, the Oxford workers[11] noted that penicillin was absorbed from the intestine of the rat without damage to the mucosa. Later[13] they reported absorption from the intestine of the rabbit, cat, and man, though the level in the blood and the percentage recovered in the urine varied considerably between the different species and between individuals within each species; thus the rabbit appeared to destroy penicillin to a greater extent than the cat or man, since by the methods then available no penicillin could be detected in its blood and little in its urine. A child of 6 months given penicillin with sodium bicarbonate by mouth was cured of a *Staph. aureus* urinary infection, though seeing that penicillin is greatly concentrated by the kidneys this was not evidence of a blood-level adequate to treat a systemic infection. Rectal administration resulted in very poor absorption because bacteria in the fæces destroy the penicillin. Acid-resisting capsules were thought too unreliable to be entrusted with such a valuable drug, and were later shown[14] to dissolve at widely different times in the same person on different occasions. At this time (1943) an attempt was made to treat two patients by capsule and duodenal tube. Although the dosage would now be thought entirely inadequate for the conditions treated, and there was [illegible] was demon- [illegible] ine of both patients.

In America RAMMELKAMP and his collaborators[15 16] were then investigating the absorption and excretion of penicillin given to man by various routes, including the mouth, duodenum, and rectum. In-vitro studies showed that saliva, bile, succus entericus, and pepsin did not destroy penicillin, and that destruction was proportional to the acidity of the gastric juice. With adequate absorption after an oral dose—for instance in an achlorhydric subject—a bacteriostatic level was maintained in the blood-serum for at least as long as after intramuscular injection of the same amount; in two such subjects 23% and 40% was excreted in the urine. After administration by duodenal tube the blood-level rose and fell sharply,

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[illegible] wis T. *Brit med J.* 1941, ii, 795.
[illegible] ent, F. K., Nathanson, M. H. *Arch Surg* 1944, 49, 17.
[illegible] ain, E., Florey, H. W., Gardner, A. D., Heatley, N. G., Jennings, M. A., Orr Ewing, J., Sanders, A. G. *Lancet*, 1940, ii, 226.

12. Garrod, L. P. *Brit med Bull* 1944, 2, 2.
13. Abraham, E. P., Chain, E., Fletcher, C. M., Florey, H. W., Gardner, A. D., Heatley, N. G., Jennings, M. A. *Lancet*, 1941, ii, 177.
14. Florey, M. E., Florey, H. W. *Ibid*, 1943, i, 387.
15. Rammelkamp, C. H., Keefer, C. S. *J. clin. Invest.* 1943, 22, 425.
16. Rammelkamp, C. H., Helm, J. D. *Proc. Soc. exp. Biol. N.Y.*, 1943, 54, 324.

as it does after intravenous and intramuscular injection, but the peak level was less than 10% of that attained by parenteral injection; only 16% of the penicillin given was recovered in the urine, whereas the recovery after intravenous or intramuscular injection was never less than 37%, and usually much more. The same workers observed in another investigation,[17] in which excretion was slowed by diodrast, and also in two patients with renal failure,[15] that less penicillin was recovered from the urine when excretion was delayed, suggesting that there was slow destruction in the body. Similar observations were made in the dog by BEYER et al.[18] RAMMELKAMP and KEEFER also confirmed[15] that after rectal administration a bacteriostatic level was not reached in the blood-serum.

Recently another group of workers in the United States[19] have administered penicillin in large doses (100,000 units) to "normal" subjects by mouth, and demonstrated its excretion in the urine for some hours; from 8% to 33% was recovered. The simultaneous administration of sodium bicarbonate reduced the amount recovered, instead of increasing it as had been expected; but it is to be noted that penicillin is even more rapidly inactivated by alkali than by acid, so that a check on the purity of the bicarbonate is highly desirable. Unfortunately this work is incomplete, since no study was made of the acidity of the gastric juice or of the penicillin levels reached in the blood-serum. Now on another page LITTLE and LUMB produce more data. Some of their findings, such as the high proportion of the drug excreted in the urine after oral administration, conflict with previous reports. Others, such as the use of egg albumin as a vehicle for oral administration, are new, and their scientific basis has yet to be elucidated. In view of the promise of easier and more comfortable therapy which these investigations hold out, they deserve repetition and expansion, using the most refined methods of assay available. But as long as the supply of penicillin falls far short of potential demand, as it does today, no-one will wish to introduce a new method of use without complete assurance that it is economical as well as effective.

A MEDICAL PRINCIPAL

IT is perhaps one sign of the Oxford medical renaissance of the last twenty years that Somerville College should have broken with precedent by appointing a woman doctor to be its next principal. Dr. Janet Vaughan's qualities and experience abundantly justify the innovation. She has a scholastic and literary background as the daughter of the late William Vaughan, headmaster of Wellington and Rugby, and granddaughter of John Addington Symonds; her investigations at University College Hospital and the British Postgraduate Medical School brought her into the first rank of hæmatologists; during the war she has administered a large blood-supply depot; she is the first woman counsellor of the Royal College of Physicians, and serves on its committee on social and preventive medicine; she is one of the seven trustees of the Nuffield Foundation; and her other public work includes membership of the Goodenough Committee, the Royal Commission on Equal Pay, and the small body of experts who have recently been in India advising the Bhore Committee about medical education. Forty-five years of age, she married in 1930 Mr. David Gourlay, and they have two daughters.

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17. Rammelkamp, C. H., Bradley, S. E. *Ibid*, 1943, **53**, 30.
18. Beyer, K. H., et al. *Science*, 1944, **100**, 107.
19. Free, A. H., Leonards, J. R., McCullagh, D. R., Biro, B. E. *Ibid*, 1944, **100**, 431.

Annotations

DRUGS FOR MALARIA

WRITING under this title on Nov. 18 last we remark that "although malaria has always been of immen importance to the British Empire," we owe our escape from a dangerous position to the enterprise of the German chemical industry supplemented by American energy in applying the product to military purposes. All will agree that the Allies are indebted to the Germa workers who invented mepacrine ('Atebrin') before the main quinine-producing areas were taken by th Japanese; but it has been pointed out that our commen does less than justice to the precautions taken by th British Government to build up a reserve stock quinine, or to the success achieved by British facturers in producing mepacrine. Since the war 1914–18, when quinine supplies were secured only b delicate negotiation, the possibility of a shortage in war-time has, we are informed, been fully appreciated by the authorities in this country. In 1938 ments were made to ensure that as much quinine possible was held throughout the Empire: a consid national reserve was purchased, and in addition at le two years' supply was obtained and held by most of Dominions and Colonies. The manufacture of sy antimalarials is a complex process, and mepacrine not made completely in the United Kingdom on large scale till 1941, when intermediate substances w no longer obtainable from France. Thenceforward, h ever, progress was rapid. It was in March, 1942, that Japanese overran Java, which provided over 90% the world's supply of quinine, and by that time mepa production here was already considerable. Officers the Ministry of Supply at once visited the USA to a joint programme for further production, and th fulfilled as successfully here as in America. In 19 output was 40 tons, and this amount was more trebled in 1944, when at least 150 tons was prod Each ton provides about 10 million tablets, and in over 395 million tablets made by three British firm allocated to the Services, Dominions, Colonies certain Allied and neutral countries. The 194 duction will satisfy demands approaching 1500 m tablets, and it is already evident that such demand be exceeded and met in 1945.

WHAT DETERMINES POLIOMYELITIS EPIDEM

LABORATORY mice sometimes contract a virus di often called Theiler's disease after its discoverer. resembles poliomyelitis in man so closely that many hoped to learn more of the human disease by study murine counterpart. A first exciting step wa discovery that Theiler's virus is to be found i fæces, and (less abundantly) in the intestinal wa almost every young mouse. Nevertheless, natu occurring paralysis was extremely rare. This fit with the current tendency of students of human myelitis to pay more attention to the intestine an to the nose as a portal of entry. Poliomyelitis viru recovered from stools more readily than from washings; it was found in sewage; it turned up i caught in the wild state. Theiler's virus is often neurotropic tendency; so suggestions were made human poliomyelitis virus was, like it, ubiquitou not always sufficiently strongly neurotropic demonstrable by inoculation into monkeys.

Why should a ubiquitous denizen of the int reveal its presence by causing epidemics of disease? Sven Gard[1] of Uppsala has made some vations on the mouse disease which may afford a In his stock of mice, producing 6000 animals a Theiler's virus was regularly present in the sto

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1. Gard, S. *Yale J. Biol. Med.* 1944, **16**, 467.

young mice, but paralysis appeared only sporadically—in 2 animals during more than three years. There were also, however, two "minor outbreaks," involving 4 and 5 cases. First, in July, 1941, there was an outbreak of infection by *Salmonella enteritidis* (Gaertner's bacillus). While this was at its height in the two following months, 4 cases of paralysis occurred and histological study showed the typical picture of Theiler's disease. The virus was recovered from the central nervous system and lymph-nodes of one mouse, but difficulty in obtaining mice of a clean stock prevented exhaustive studies. The second "minor outbreak" also coincided with an epizoötic in young mice which was characterised by profuse diarrhœa. Necrotic spots in the livers of affected animals showed thread-like organisms which could not be cultivated, but were identified as the *Bacillus piliformis* of Tyzzer. A batch of 100 mice affected with the disease was set aside for study, and after three weeks all but 16 had died. Of these survivors, 5 had flaccid paralysis of the hind legs. Strains of Theiler's virus were recovered from the central nervous system and intestinal lymph-nodes, but could not be continuously propagated by intracerebral inoculations.

In these observations Gard sees a possible clue to the epidemiology of poliomyelitis in man. May not an intestinal bacterial invasion open up the way for our ubiquitous virus to reach the lymph-nodes, where it is at least one stage on the road to the central nervous system. May not the minor illnesses associated with [illegible] epidemics be, after all, not abortive cases [illegible]se, but rather instances of an associated [illegible]ich, in the unlucky, opens the way to an attack by the virus? A biphasic or "dromedary" type of fever curve is said to occur in 60% of cases in some epidemics. (To be zoologically correct we should call it a Bactrian-camel curve.) May not the first wave be due, not to a systemic invasion with poliomyelitis virus, but to the associated infection? May not the seasonal incidence of poliomyelitis have more to do with the spread of intestinal infections than of the virus itself? These suggestions may prove right or wrong: they at least open up an interesting line of thought.

We are accustomed to the idea that virus infections pave the way for secondary bacterial invaders. The notion that bacteria may pave the way for viruses is not new, for we know of herpes simplex activated by pneumococcal and other infections, and we may yet learn that there is a rheumatic-fever virus activated by [illegible]. But the way of the epidemiologist is [illegible] seeking the cause of epidemics of disease [illegible] due to organism A he has to look for factors favouring the spread of organism B.

DELAYED AMERICAN JOURNALS

THE irregularity and delay in the arrival of medical and scientific journals from America are still almost as bad as in the worst days of the battle of the Atlantic. The journals, it is true, do arrive in due course—whole issues are no longer irrecoverably torpedoed or pages obliterated by a too-zealous censor, misfortunes which were cheerfully borne in 1941—but they lose much of their interest from being two months or so out of date. Some allowance must no doubt be made for the conditions of publication in the United States, where though paper is plentiful printing may be held up by priorities which do not extend to scientific publications. Thus a monthly journal may appear long after its nominal date, and its final arrival here be correspondingly late. But this cannot apply to such a regular and important weekly as the *Journal of the American Medical Association*. It is bad enough that this should always reach us at least six weeks after publication without two consecutive issues being delivered together, one six and the other seven weeks old. A Gilbertian touch is added by a Board of Trade notice that parcels of scientific journals from the United States are liable to seizure by the British Customs unless an import licence has previously been obtained by the importer, even when the journals are unanticipated gifts. How is one to apply beforehand for a licence to import a gift of which one knows nothing till told that it is impounded by the Customs Office? But the regular issues of the journals can hardly be being delayed by the Customs. Where the delay does arise is a matter of some public concern. When news can arrive hot by radio or cable, scientific and medical information should be available from our closest allies as regularly as war conditions allow and at least as promptly as ordinary mail. Medical research surely deserves some privilege and priority.

PLASTIC ARTIFICIAL EYES

FOR some years British and American investigators have been examining the possibilities of the acrylic resins for making artificial eyes. The glass eye has done admirable service in the past, and a well-made glass eye in a good socket can have a very lifelike appearance. But all glass eyes suffer from disadvantages. They break when dropped—no unlikely occurrence in the daily manipulations required to insert and remove them—and they have a life of two years at most, for the chemical action of the tears causes corrosion and roughens the smooth surface of the glass, and this in turn leads to a sore and inflamed socket. Suitable acrylic resins have been devised which are more durable and lighter than glass, and can be trodden on without breaking. *Being more workable than glass they permit of a more* exact fit to the socket, and an elaborate technique for making them is now employed by the United States Army medical service. By using a plastic material of low melting-point which just sets at body temperature a cast of the eye socket is taken. From this original, successive positive and negative moulds are taken until finally a negative mould of the eye socket is obtained into which liquid resin can be poured. The iris has previously been painted on a fine celluloid disc, and this is incorporated in the plastic eye, together with conjunctival vessels made of rayon threads, the whole being finished off in a clear plastic solution which gives an appearance of moistness. The results, both in comfort and appearance, are said to be well worth the trouble. Later modifications will no doubt shorten and simplify the technique.

PENICILLIN AND SUBACUTE BACTERIAL ENDOCARDITIS

SUBACUTE bacterial endocarditis is among the more distressing tragedies of human illness. Usually seen in young people, it is a threat to all those with a rheumatic or congenitally deformed heart. The discovery of penicillin has raised hopes that here at last might be a cure, though reports from America have so far been no more than suggestive.[1] No investigation will be convincing unless it is based upon a reasonably large séries of cases, and our readers will be glad to see the announcement on another page by the Penicillin Clinical Trials Committee of the Medical Research Council that they are establishing ten centres to which physicians are invited to send their cases. The patients will be given penicillin according to an orderly plan, and followed by clinical and bacteriological studies, so we should soon learn whether there is an immediate response. The ultimate effect cannot be judged without observation over several years, but even a successful immediate response would be an advance on present results and would justify further investigation. On the other hand, initial failure would enable us to change our tactics and seek some other line.

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1. See *Lancet*, 1944, ii, 117. *J. Amer. med. Ass.* 1944, 126, 233. *Amer. Heart J.* 1944, 28, 669. *Nav. med. Bull., Wash.* 1944, 43, 1010.

Special Articles

THE WOUNDED IN THE LOW COUNTRIES AND GERMANY *

FROM OUR SPECIAL CORRESPONDENT

THE medical organisation of the 21st Army Group is as extensive, as elastic, and as mobile as the other branches of the Army services. It serves at the bases in Belgium and Holland and it goes with the advanced forces as near to the fighting line as the units belonging to individual formations require.

The Aid-Post

The regimental aid-post in present war conditions is a very movable, and very much moved, organisation. The RAP I visited at Waldefucht in Germany had been very much in action two days before. Two of its ambulances and one ambulance jeep had been shot up at about 6 in the morning by a Tiger tank just outside a small house *in the remains of which it was installed.* And the officers and men of the RAP had had a front-seat view of a battle across the street about 50 yards away between six Tiger tanks and a six-pounder gun commanded by an officer and sergeant of the KOSB's. At a few yards' range two of the tanks were knocked out by a six-pounder and the other four withdrew. The destroyed Tiger tanks were still on the scene, but the blood of the wounded officer and sergeant which had stained the snow had disappeared.

Waldefucht is a little town with two ancient gateways of brick still guarding the road as it enters and leaves. Perhaps there are remains of walls around this little place, but I did not explore them, for there were many mines and no certainty that all had been located. Even walking round the house, which had been a very completely stocked chemist's shop, we had to be very careful indeed. Going round the house I was piloted by a junior RAMC officer and the assistant director of medical services of the division. The ADMS asked whether the ground had been tested for mines. The medical officer replied that he was not sure, and added, with Sir Walter Raleigh politeness: "Let me go first, sir." On which the ADMS, who has the reputation of preferring to be with the leading platoon in a fight rather than at a field-ambulance station, snorted and walked straight on. I followed as carefully as possible. None of us was blown up or even shoe-mined. The shoe-mine is a little mine, but big enough to damage a leg badly if trodden upon—and take another man out of action.

In the shop I saw three rooms full of bottles and jars containing drugs, and large tiers of drawers filled with pharmaceutical and medical necessaries; also an extensive distillation plant in one room, and there was a well-stocked basement besides. Most of the things were undamaged, but there was a fall of bricks and underfoot rubble in one place, with the remains of an excellent weighing machine, labels, bottles, and unidentifiable fragments trampled into the debris. One wondered if the chemist who had fled before the troops arrived had booby-trapped any of his many cherished possessions.

The RAF had installed itself in a house not far from one of the great entrance archways of the town, which were of a beautiful old red brick and built at some time in the considerable thickness of an old city wall. The vault of this entrance way, about 20 feet long, was built with curving supporting arches which must have been the pride of some builder craftsman's heart. Now there were large chunks hacked out of the brickwork at one side where a Tiger tank had jammed and shot itself free, and scars and wounds where flying shell fragments had knocked off a brick or two or excavated a hole in a wall.

The main dressing-room of the RAP was in the sitting-room of the house just to the left of the entrance where the front door had once been. Some of the furniture—a modern and ugly small sideboard, a sofa, a stuffed armchair, and another chair or two and a table—were still in the room. On the sofa was a case with stocks of bandages and dressings. On the table was a spirit-stove steriliser cooking up a hypodermic. In a corner in a case were splints and more packages. Mud from the road outside had been tramped into the room, but the essential ring of cleanliness around bandages and dressings was maintained amid the weltering dirt of war. Down below, down concrete steps, was a concreted cellar with a very small window high up, which, however, gave a good light to a neatly arranged and very full supply store. The concrete cellar was strong, and in this old town there were many more such modern intrusions in its very much older architecture. It was said that these cellars represented a line of outposts of the Siegfried Line which is not very far away.

The operation on which the RAP had been functioning, and indeed was still functioning, was based at Sittard in Belgium, and had been one which had cleared a big loop in the river Maas beyond which the Germans had retired. The question now being asked was, were the Germans retiring still farther and were they leaving the Siegfried Line to hold instead the line of the river Rhine ?

Nothing very active was happening at the time of my visit. Some bangs and cracks of shells at intervals were all there was to be heard, but there was always the possibility that some final sniper had been overlooked, although it was believed all had been cle red out. In a wood near at hand there were still G bodies. But the MO said that he had not smelt any dead Germans that day.

CIVILIANS

The main street of Waldefucht curved to the le passed through the gate by which I entered, and on to a vista of houses gashed with shell-holes, col roofs, and walls cascading into the street—one foaming wreckage of household furniture as a cre wave. It was desolation, savage destruction, a grime and sordid detail of war left over. There smell of dust and rubble, of filth and faint putref

A big and once-beautiful old church in the main was scarred with shell marks, picked out with holes by shell hits; its steeple, with a fretwork p of shell-holes, crazily maintained an upright po And in the street the mud churned up and sque over everything—a stream of lorries, tracked ve guns, tanks, and ambulances, and, recently, m foot.

Looking into the courtyards of two houses—th courtyards they were with doors of open barns— in one an old, old woman and two small childre another I had a glimpse of a woman of about 30, r looking, blonde, stepping briskly across the far debris with a bucket in her hand. I also saw in the an ancient and etiolated old man. There were to be 500 Germans in the place, mostly living in cellars, and many of them had applied for treatm the MO at the RAP. He had evacuated one c tuberculous meningitis and another of diphtheria. most of the cases were not serious and he was in an handling them over to the Civil Affairs doctor a as he arrived. It was said that a German civilian was to be made available at any moment.

IN ACTION

The attack which brought our forces into W and a good deal beyond it, threw a great strain medical services. One position captured by tanks, a considerable detour over tank-possible country, not be approached directly from the position originally established by the MO for a dressing-station, except in an amphibious vehicle. A temporary collecting-post was [illegible] aptured position on the first [illegible] taken there. But the road [illegible] closed by the enemy, so that field-ambulance transport could not use it. The ADMS of the division decided under the circumstances to evacuate the relatively few abdominal and chest cases by the amphibious vehicles through the field ambulances, and the commander of the troops decided to clear the road for the evacuation of the remainder by the necessary short and sharp attack. This having been done successfully, evacuation of casualties from the tank battle was carried out by the road cleared and the RAP went into its next position. Most evacuation is carried out by ambulance, long hauls by bearers carrying stretchers are rare.

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* Sequel to last year's articles, entitled The Wounded from Normandy (*Lancet*, 1944, ii, 253, 278, 383).

As I was leaving the RAP a group of men formed up outside. They were due for an inoculation. The MO excused himself, and got on with the job. Fighting, marching, sleeping one day in the shelter of a house or cellar and the next day in a foxhole, the mobile warfare is not allowed to interfere with the carrying out of hygiene measures.

Trench foot is avoided—there is practically no trench foot among the British forces—by the well-known [illegible] socks and rubbing the feet and [illegible] extra pairs of socks, a favourite [illegible] ng one over each shoulder under [illegible] ion by lice and scabies is as rare in this war as it was common in the last. The mobile bath unit has a high priority. Rations are of course very good. And medical front-line requirements are as efficiently supplied as artillery front-line requirements. Oddly enough, as all with active service experience know, gunners and medical units have a way of competing for positions to carry on their jobs. The map reference X which suits the field ambulance has a way of suiting equally well the gunners. Nowadays the claims of the ambulance have at least equal priority, and when the ADMS is active and belligerent the gunners by no means always come off best.

The casualties in the very successful action in which the RAP which I visited took part as one of a number, all of which I did not see, were officially described as "light." Light they were in both dead and wounded, but they added one more little cemetery behind the front line where I saw the graves being neatly ordered and the wooden crosses in rows behind being put up. So it is a good thing to know that the medical services not only restore a large proportion of the wounded to their pre-wounded health and activity, but also save from death a large number who, in previous wars, would have been beyond hope.

Field Ambulance and CCS

Behind the line of regimental aid-posts of battalions and other units lies the [illegible]

[illegible] ambulances fulfil the same functions in this war 1939–45 as they did in 1914–18. They are more mobile; they work even more closely with the battalions; and they have developed new forms for paratroop formations and armoured formations. But the differences are adaptation to new conditions, not in their essential functions of acting as a link between the units of a division and the hospital formations behind it.

The CCS and the advanced surgical unit are often very near the fighting line. In a recent operation one of them was for a time only half a mile away—a period of some anxiety for those concerned in safeguarding the [illegible] of evacuation of wounded farther back and the safety of the personnel, including nursing sisters, of the CCS. But the medical services—including the sisters—are not only in battledress, but also very much in the mood of high-speed battle efficiency.

BUILDINGS OR TENTS?

Up to the time of my visit at the beginning of this month it had very often been possible for a CCS to find a good building in sound repair in which it could set up its reception-rooms, its wards, and its operating-theatre or theatres, and house its personnel. This was because the fighting in southern Belgium and Holland was in areas which the Germans evacuated so quickly that destruction was on a large scale only where resistance was heavy and fighting intense. A long way out from Brussels towards the fighting area villages and towns have received comparatively minor damage. Driving through these places there are few signs of physical destruction, and in some there are no signs at all. The shops, the houses, the churches, the schools, and the other public buildings seem to be as they have been for many a long year past. The fields are tidily and (one presumes) well cultivated, for the Belgians are good and industrious farmers.

But what the conditions will be as we progress further into Germany it is difficult to foretell. If the Germans resist stubbornly, as they did at Aachen, the houses and public buildings will no longer be available for medical uses.

[illegible] fc [illegible] Indeed bc [illegible] ts is to pc [illegible] other fit [illegible] to be [illegible] ing, but fall into their places in the tent space allotted them. Incidentally, this makes the layout simpler, and the CCS in tents can be put up anywhere, provided the condition of the ground is suitable. In the phoney war of 1940 the CCS's in France were operating on plans of organisation and transport now modified to fit in with the conception of mobile warfare. The school of the desert campaigns taught the Army very much. Now a CCS is a highly mobile organisation moving on a strictly limited amount of transport and able to be dismantled at one place and re-erected at another in an astonishingly short time. The CCS, helped by the addition of special surgical teams—one, two, or more as required—is capable of dealing with any call that may be made upon it.

WORK OF CCS

At one CCS which I visited it was the practice to keep cases of abdominal and chest wounds for about 10 days, to send head injuries straight on to hospitals farther back especially equipped to deal with them, and to evacuate normal cases as fast [illegible]

The CCS deals [illegible] any casualties tc [illegible] but with [illegible] which may occur in its vicinity. I saw a Sten-gun accident case brought in for operation from the immediate neighbourhood of one CCS; and these hospitals also deal, for instance, with road accidents.

Another function of the CCS is the provision not only of emergency dental work but of conservative dentistry and particularly artificial dentures. At the CCS there are not only first-class dentists but first-class dental mechanics. The making of artificial dentures is done very quickly, and a man who might have to waste months if he had to go to base for artificial dentures can now get them in days. He is also sure of getting them at once instead of having them follow him by post as happened when dentistry was done at base.

Dental service, including the provision of artificial dentures, is given also in the divisional areas in advance of the CCS, operationally through the intermediary of the mobile dental units.

One CCS I saw was in a large building in a town. The installation for advanced surgery was in an experimental wing of a factory. It cannot often be that an advanced surgical unit finds itself installed in a building with tiled floors, glazed brick walls, excellent central heating, and first-class electric lighting. But so it was, and the acting OC of the CCS asked me to be sure to make it plain that surgical work in advanced areas is not done in foxholes, as some of his friends in England seemed to think.

It is in the CCS area that modern surgery has had some of its greatest opportunities and contributed most to the saving of life. Surgery at the field-ambulance level is best restricted: the business of a field ambulance is to get the wounded back as quickly as possible to the CCS. And at the field ambulance blood-transfusions should not be done except in cases of grave emergency. But in the CCS much surgery can be undertaken, and it is to the surgery at advanced units at the CCS that perhaps the greatest advances in the saving of life and health have been made in this war.

Evacuation

Evacuation from the CCS to areas farther back is partly by motor ambulance, partly by ambulance train, and partly by air. Cases which will need a long period of treatment are sent preferably by air. From advanced air-strips planes take many cases on an air-lift to hospitals farther back. From these hospitals they can be evacuated to England by the Air Evacuation Service and by hospital carrier. It is not possible to dispense altogether with any means of evacuation. The motor ambulance is indispensable for short distances; and on occasion for special reasons can be used for long distances. Evacuation by train and hospital carrier is also indispensable. Given the right weather, evacuation by air is to be preferred in all cases. But weather cannot be guaranteed. There may be periods, for days together, when the air-lift from the forward air-strips for evacuation by plane from the air-fields farther back is impracticable.

In practice, about a third of the wounded are evacuated by air and the remaining two-thirds by train and sea. But proportions may alter as weather improves, and as—with the advance in Germany—the line of evacuation gets longer. In this field of operations, as in every other, the Army medical organisation is very mobile, very adaptable, and capable of meeting the demands of any operational situation.

VARIED CIRCUMSTANCES

The sample of front-line and CCS medical arrangements which I saw was only a part of the whole long front on which operations are proceeding. It was in the southern part, near Maastricht, in that tongue of Holland which lies between Belgium and Germany. Conditions near Eindhoven or in other places would be different. But the organisation of the medical service is so adaptable that it has been able to meet any conditions which may present themselves. The range of experience of the medical officers is also very wide indeed. For example, the senior medical officer who took me round the CCS had been in charge, in another capacity, of the medical operational work at Arnhem. An ADMS whom I met had added to his duties in the island of Walcheren, where he happened to be with the advancing troops, by personally carrying a wounded commanding officer out of the line.

First-class work is being done by medical formations under many different circumstances. None have so far been met which have prevented the Army medical organisation in the line and immediately behind the line from carrying out its functions successfully.

(*To be concluded*)

ROYAL COLLEGE OF SURGEONS

RESTORATION AND DEVELOPMENT FUND

On Feb. 14, the birthday of John Hunter, Sir **Alfred Webb-Johnson**, the president, sent the following letter to each fellow of the Royal College of Surgeons:—

"The time has come when we must prepare for the restoration of our college. The sum which will be received from the War Damage Commission will not cover the whole cost of restoration: moreover we have a unique opportunity to carry out many improvements which will make our college an even more worthy headquarters of British surgery. Among the amenities which it is proposed to provide are a large conference hall, common rooms, extensions of the museum and library, accommodation for the new professors, and more research laboratories. It is estimated that £250,000 will be required to complete the scheme of development. In order to have a free hand in planning, and, at the time, to provide space for the sister colleges if they decide to move to Lincoln's Inn Fields, the council has acquired several adjoining properties.

"The future scientific influence of the college has assured by the generous endowments we have recei from Sir Buckston Browne and the Bernhard Bar trustees, and from our latest and greatest Sir William H. Collins. I now appeal to fellows of the college for donations to the Restoration and Development Fund. I realise that commitments vary for all of us and that many of us have suffered considerable fina loss owing to the war, but I want every fellow to feel that he has made some contribution towards making our college worthy of its progressive outlook and great history and traditions.

"Past and present members of the council and court of examiners have subscribed over £10,000.

"The appeal has been supported by the American College of Surgeons, the Royal College of Surgeons of Edinburgh, the Royal College of Surgeons in Ireland and many surgical Associations. Donations can earmarked for special purposes and can be spread a term of years. If a gift is intended for the scientific departments a seven-years covenant can be ent into with the result that the benefit to the college will be greatly increased. I rely on you to help as generously as possible."

In present circumstances it is impossible to send appeal personally to members of the college, and ot members of the profession, but it is hoped that all are interested in the work of the college will join with fellows in subscribing to the fund. The preliminary scriptions include £2100 from the President, £2000 as first donation from the American College of Surgeons, £1000 from the Royal College of Surgeons of E

On Active Service

AWARDS

DSO

Lieut.-Colonel A. McC. Campbell, MB GLASG., RAMC

MBE

Major J. L. M. Anderson, RCAMC
Major F. J. S. Bowman, MB ABERD., RAMC
Major N. R. Butcher, MB EDIN., RAMC
Major F. O'K. Craven, MD NUI, RAMC
Lieut.-Colonel W. S. Harvey, MB EDIN., RAMC
Major J. G. Jose, RCAMC
Major Harold Kennedy, MB BELF., RAMC
Major J. C. Luke, RCAMC
Major R. L. MacPherson, MB EDIN., RAMC
Major H. K. Meller, MB CAMB., RAMC
Major R. A. Mustard, RCAMC
Major P. A. Scott, RCAMC

MENTION IN DESPATCHES

RAMC.—Colonel C. E. Eccles, OBE, LRCPI, Lieut.-Co C. D. Evans, OBE, MB CAMB.

RCAMC.—Colonel G. A. Sinclair, Lieut.-Colonel J Palmer, Majors G. M. Bastedo, J. K. Bell, J. A. Brad D. R. E. MacLeod, E. A. MacNaughton, P. J. Maloney, Melanson, E. Quehl, L. J. Quinn, J. G. Shannon, F Shipp, P. M. Spence, A. R. Tanner, P. K. Tisdale, Ca G. C. Bowes, J. A. Gow, T. Statten.

In England Now

A Running Commentary by Peripatetic Correspondents

"THE best way to get this country right," according to my son's letter from Greece, "is for England to help at once by setting up a British medical school much as Cantlie did in Hong-Kong. Not only would it be the centre of our future activities, which will be mostly medical in nature, but it would provide modern Greek doctors able to look after this deplorably low-standard (physically) nation. Put forward your best efforts to get such an institution started as soon as possible in Athens. It is not an idealist's dream or a vague philanthropist's reaction to the present-day distress. It is a necessity."

* * *

For my fifth shot at Medicine I was determined to leave nothing to chance. I arrived at Queen Square a good two hours before my clinical and settled down in the cloakroom this time to discover *all* the cases. "There's a chap called Mr. Pluckrose," I was told, "with fibrosis of his right lower lobe following pneumonia. A [illegible] ask him how 'The Blues' [illegible] nd for life. Look out for a [illegible] your left as you go in, and they've got a chap with one of those dystrophy thingamies. Also an old boy with heart-block in a dirty blue muffler."

As it happened I got none of this selection. My [illegible] with an attractive young woman [illegible] her age as 23 and her occupation [illegible] advance on the usual hoary old [illegible] was an excellent conversation- [illegible] about the weather for a little, and the number of times both of us had been up for this particular examination. Was I a Cambridge graduate, by any chance, she asked, for she had recently been working there, in the Art School. I told her I had gone down more years ago than were good for me, and we talked about the Backs in the autumn, just at the beginning of the Michaelmas term, when the weeping willows at Trinity Hall turn an exquisite deep gold and trail in the chilly-looking waters of the Cam; and in the springtime, when the pink and blue crocuses fleck the lawns at Queens' and the shiny banks of daffodils brighten your Sunday afternoon stroll across Trinity bridge. We discussed the perfection of King's chapel, [illegible] sunlight, [illegible] slipping [illegible] ear them [illegible] I found myself [illegible] the sordidness [illegible] xamine you," I [illegible] 'ained, undoing [illegible] ok at anything [illegible] "I don't suppose I shall be able to hear anything," I told her sadly, "I never can."

Nor could I: I was already resigning myself to another three months in the non-wage-earning class when she whispered "Did yo [illegible] You can only bring [illegible] my left side or on [illegible] fever, but I had gro [illegible] a bit enlarged too, they seem awfully pleased if you notice that—I'm perfectly well compensated, and he'll ask you all about a barium swallow." I would have sent her some flowers, but she wouldn't give me her address. "They often ask," she told me sweetly, "but I never give it away. You don't need it in the history, anyway."

* * *

In a 2500 miles' lecture tour in Italy and Malta, I offered three kinds of lectures, all dealing with post-war reconstruction. Not many of my RAF and Army audiences asked for a lecture on the National Health Service, but that was the subject of several gatherings composed wholly or mainly of medical personnel in uniform. One way and another I talked to close on 300 doctors about the future of our medical services.

The RAMC regulars took little interest in the scheme and had no opinions to express: their careers would, they thought, be unaffected. The temporaries were, however, very keen, though about half of them did not know much about it and had not filled up the BMA questionary. They even complained of lack of information, which seemed to me to be a serious failing. But I cannot say that I was surprised. It was a typical condition among the 11,000 officers and men whom I addressed in 34 lectures about all the official plans for resettlement and reconstruction at home.

The first spokesmen at my medical meetings were [illegible] who were specialists [illegible] senior officers rather daunted [illegible] but many men who [illegible] me afterwards that [illegible] of the scheme or ac [illegible] of my meetings they got up and said so in no uncertain manner, and on one occasion practically the whole [illegible] d tore him, [illegible] to hear two [illegible] from their [illegible] the Forces [illegible] uld achieve, and they were converted. They could no longer support private practice as an ideal. My general impression was that the younger doctors are, on the whole, quite favourable to a National Health Service and keen to play their part in it when they come home. May that be soon!

* * *

Me: Is the pain in your stomach better or worse after food?

Patient: (after interval for thought): No.

Me: But does eating make you feel better or worse?

Pt: No.

Me (starting afresh): Well, when do you get the pain?

Pt: (brightening visibly): Ven I press here (indicating gall-bladder area) I get pain.

Me: But why do you press there?

Pt: Ven I press here I get pain.

Me: But *why* do you press there?

Pt: I don't.

* * *

Once or twice when I have been condemned to a week in bed, while feeling mentally active, I have found the only way to prevent myself regretting the things I might have been doing if it had been a week's real holiday was to take up some long book that has stood unopened on my shelf for years. I am sure it is twenty years since I opened the *Poetical Works of Shelley*, a school prize of even earlier date, but a week in bed was the chance of really reading it from cover to cover. Never on normal days would I have had the patience to lose myself in that remote world of beautiful aspirations and bitter despairs. A big Victorian novel, *Middlemarch* or *Vanity Fair*, too formidable to attack on a workaday evening or a summer holiday, will carry you through a week in bed with great satisfaction. Yet reading in bed has its drawbacks. When hot-water bottles are unprocurable to warm your feet, it is essential not to chill your arms and shoulders while turning over pages. Whatever attitude seems momentarily comfortable is unbearably stiff and awkward a few minutes later. I shift the pillows into a new position and the book slips off; I prop the book by a cunning adjustment of knees and blankets and then the pillows have gone crooked. Next time I am ill I must have a machine that turns over the pages. Why not now? For the problem has been solved in America. There [illegible]

[illegible] Though I cannot qualify f [illegible] non-profit corporation, I sho [illegible] adgets. I shall lie snug and press a bulb under the bedclothes like a camera-shutter extension, the microfilm will slide through its project [illegible] own on the ceiling. Or [illegible] own movies. I will not [illegible] but does the toy never jam? Can I be sure that I will not spend a whole afternoon gazing at the same page slightly out of focus on the ceiling? Never mind. What an admirable invention to have materialised into a practical possibility! And now the Aslib microfilm people have been invited to emulate the Americans and p [illegible] reading machines for the disabled over here.

Parliament

FROM THE PRESS GALLERY

The Displaced and Stateless

In the House of Lords on Feb. 7 the Marquess of **Reading** said that no real stability could be restored to Europe until the problem of the displaced and stateless people on the Continent had been solved. It was surely no extravagant conjecture that the German leaders, while planning the economic vassalage of Europe, should sometimes have calculated that if defeated they would leave behind such a legacy of slave labour, concentration camps, hostages, war fugitives, and evicted populations as to frustrate for long the efforts of their conquerors to restore tranquillity to the liberated lands. According to an official estimate by the Allied governments this organised upheaval affected between 20 and 30 million people in Germany and German-occupied countries, all of whom had to be identified, collected, sorted, fed, clothed, and ultimately transported back to their homes or what was left of them. It was only too likely that many of these people would have to depend on relief until the gradual and painful process of rehabilitation could begin. It was clear that the return to their countries of these peoples must not proceed according to their own devices and impulses, but must be systematically controlled: otherwise the roads of Europe would be strewn with millions of desperate, exhausted, sick, and starving people, and the hideous anarchy of the end of the Thirty Years' War would be re-enacted on an incomparably greater scale before our eyes.

Presumably, the first approach to the problem would come from the military authorities, whose task it would be to initiate action for assembling and accommodating these people. In the next stage—assuming that it received the necessary formal invitation—Unrra was supposed to come upon the scene, the only authority in possession of transport, supplies, medical stores, and man-power for building of huts. In a recent debate Lord Cranborne had assured their Lordships that it was not lack of administrative personnel that was hampering Unrra, but lack of transport. In conclusion the noble Marquess asked how far even now the member governments of Unrra had awakened to the urgency of this problem. Unless plans were ready to be put into operation swiftly and effectually when the moment came, the seeds of peace in Europe would have been planted in barren and infected soil.

Speaking without inside knowledge, Viscount **Templewood** said that to him Unrra seemed to be either unable or unwilling to realise the urgency and magnitude of the task. The three great Allied leaders should announce a common policy. In his view the material side, immense as it was, was less complicated than the moral one. Men, women, and children had been living year after year in inhuman conditions. It did not need a psychologist to say what reactions this tragic period might have had upon them. Side by side with an organisation fitted to act quickly, and on a broad front, there should also be a welfare organisation which could attend to these sufferers for months and years to come.

Viscount **Cranborne**, Secretary of State for Dominion Affairs, said the question was not whether the military authorities or Unrra should handle the problem of the displaced: it could only be dealt with effectively by the two authorities in combination. The experience gained by Unrra while working with the military should enable Unrra later to relieve the military of the burden, and the sooner that could be done the better. In liberated territories, of course, where the civil government was in control and Unrra had not been invited in, the responsibility remained with the government concerned. But where Unrra had been asked to help this would be one of their main functions. The problem was on a scale which had never been seen before. There were two ways of tackling it. One was by grasping at immediate aspects which seemed capable of settlement, but which were bound to be dealt with ad hoc and without overmuch regard to similar problems elsewhere. The other method was to deal with the problem as a whole internationally, and methodically work out systems of priority and machinery. It was easy to understand the desire of the advocates of the first course to press on, and to sympathise with their impatience with the international approach as being unnecessarily cumbrous and slow-moving. But there was a real danger that if they had their way they would get the worst of both worlds. Frankly, he did not believe that this was one of those problems which could possibly be tackled on an ad-hoc basis; it was too big and the numbers involved were too formidable. On the whole the results achieved by international action in the past had been disappointing because not all those nations who paid lip service to the principle of international action were in practice willing to give it a fair trial. In his view, however, we must not allow ourselves to be discouraged by the past. International action in this sphere, as in others, was a plant of slow growth. HM Government recognised the urgency of this problem, but it was no use raising false hopes that there was an easy way out. There was a common policy for repatriation agreed at Atlantic City: there were not yet detailed plans for resettlement. There would be countries of temporary refuge and countries of permanent refuge. In his view the countries of temporary refuge would have to keep a large number of these refugees permanently; he did not believe they could go on moving them about the world. But that was a matter to be thrashed out, and in the meantime these people woul have to be looked after as best they could by the Int national Committee. Certificates allowing people to into Palestine were allocated by the Jewish Agency.

Health and Education in the Colonies

In the House of Commons on Feb. 7 Colonel Ol **Stanley**, Secretary of State for the Colonies, moved the second reading of the Colonial Development and Welfare Bill which provides for the expenditure £120 million for the Colonial Empire over a p of ten years, subject to a maximum issue in any financial year of £17½ million. This sum, Col Stanley affirmed, was not intended to be the sole permanent support of the social requirements of Empire. In the long run the social standard of country depended on its own resources and upon skill and energy of its people. It would be neit right nor healthy for Britain to attempt to from the efforts of her own people the social standa of colonial territories. The aim of the Bill was give the colonies the help they must have if they to start the process of social development for th selves. The House had been warned that it was likely in the early stages that it would be possible spend the full amount granted by the 1940 Act, in fact only £1 million was spent in the first years and just over £2½ million in the first four. even despite the practical difficulties which will p the full expenditure members on all sides had been urg with enthusiasm the necessity for an increase of the allotted in 1940. There was a genuine desire among people of this country, even at some sacrifice to th selves, to help people with whom they had been so lo associated to a better standard of life. The House was committed to the doctrine of trusteeship, beyond that of partnership. There was no reason something that was good for the colonies should not good for us too.

Mr. J. **de Rothschild** said it was not only material resources of the Colonial Empire which h been neglected, but also the human beings efficiency of the average African was less than h that of the average European owing to the effec chronic diseases. Yet the African had proved capable of reaching a high standard of efficiency. native members of the Forces had improved tren dously in physique and stamina under proper and feeding conditions. It was essential that these men returned to civil life they, and the other and women who shared their existence, should h health services, sanitation, and water-supply as goo those provided in the Army. The tsetse fly must wiped out, hookworm and bilharzia abolished. If resources of the colonies were to be developed it only be done by healthy and efficient people would thus benefit themselves, this country, and rest of the world. Mr. S. **de Chair** said that machinery of government in the colonies was for a simpler age. The Colonial Secretary had be a bottleneck. He suggested it would be advantageous if kindred subjects in colonial administration, such as education, health, and so on, could be grouped together and made the responsibility of one man.

Dr. H. B. MORGAN asked why West Indians did not receive appointments under the Colonial Development and Welfare Act. It was time that we developed an educational system which would give opportunities to the local indigenous product who showed by what he had done already that he was fit to hold these appointments. Why should medical men from the West Indies with knowledge of local conditions and tropical diseases, as well as West Indian psychology, not be appointed as medical officers to the Comptroller's staff under the West Indian development scheme? Why should a retired officer on pension be given this appointment? This money for colonial development was being spent on a good purpose, but he was against the machinery by which it was being made available. To begin with Colonel S. ALLEN wanted the money mainly to be spent on health and education. Until the figures for venereal disease were considerably lower they would never get an African population which was able to carry on.

Sir WALTER SMILES thought that medical research was one of the means by which the African countries might be brought together. Bilharzia was found on the banks of the Nile and right down into Southern Rhodesia. If the human pollution of all the rivers, lakes, and ponds could be stopped for 24 hours the disease would be stamped out, but no matter how energetic the Secretary of State was he could hardly achieve that. Medical research in Africa should not be confined to the British colonies but should extend from Egypt right into South Africa. Sir Malcolm Watson of the Tropical School of Medicine had been asked to advise on malaria in the copper belt and the mines in the middle of Northern Rhodesia, and the result was that there was now practically no malaria there, although the district was extremely malarial. The Union of South Africa had a wonderful medical service in the mines in Nyasaland and Northern Rhodesia to deal with South Africans who emigrated there, where great attention was paid to the diet of the workers; in no place had he seen any natives who had a balanced diet of their own. But when they went back to Nyasaland they were immediately infected again with bilharzia and they became thinner and more unfit for work. It was all very well to say that the colonies should depend on the energy, skill, and enterprise of the natives, but some of the tropical diseases would have to be stamped out before these poor people had the energy to work as they should.

Colonel S[illegible] the debate, said that the colon[illegible] fully aware of the need for [illegible]d continued training necessary to fit the returning soldier, not for his old civilian life, but for something better. But it was no good, certainly at the moment, looking for a solution in the direction of making more appointments. The difficulty was to find anything like the number of people to fill existing appointments. He challenged Dr. Morgan to say whether in his lifetime there had not been a progressive growth of posts in the West Indies filled by people born and bred in the West Indies. It was, of course, the policy of the Government, which they were carrying out, to improve the chances of people in the colonies of getting appointments in the Colonial Service, but this showed the immense importance of increasing facilities in the colonies for training them to fill the jobs. It was academic to argue whether education or health should be placed first in these plans, because they could not get anywhere without both.

VOLUNTEERS FOR RELIEF WORK.—Mr. WILLINK said that of the 40 local authorities who had been invited to consider the temporary release of medical officers for service with the Civil Affairs organisation in the liberated countries of Europe so far 14 had consented.

REFRESHER COURSES.—Mr WILLINK said that his scheme to provide refresher courses for serving medical officers will include qualified and registered practitioners now serving in HM Forces not as medical officers.

QUESTION TIME

Education of Handicapped Children

Mr. R. C. MORRISON asked the Minister of Education what steps he has taken in fulfilment of the promise given in the debate on clause 31 of the Education Bill to consider appointing an advisory committee on handicapped children.—[illegible]dvise [illegible]pecial [illegible] may [illegible]hair- [illegible]at the [illegible]A. E. [illegible] and Mr. E. W. Woodhead, director of education for Kent. To assist the committee in their consideration of any specific question, I shall, from time to time, appoint as additional members persons possessing special knowledge and experience of the particular category of handicapped children concerned.

Malnutrition in Liberated Countries

Earl WINTERTON asked the Prime Minister if he would cause a command paper to be published showing, on the information of British representatives, the amount of malnutrition and lack of commodities essential for health in France and the freed portions of Belgium and Italy; how far this was due to allied military requirements of ships and rolling stock; and the steps being taken to relieve the situation.—Mr. C. ATTLEE replied: The responsibility for the provision of commodities essential to health for liberated territories during the military period is one for the combined United Kingdom/United States military authorities. In making their preparations these authorities have naturally had to take into account the severe limitations imposed by shipping, port capacity, and internal transportation. These factors have greatly increased the difficulties of dealing with the situation and it has therefore not yet been possible to maintain or even to reach the full standards aimed at in all cases. But the reports received do not indicate any serious malnutrition, except in certain areas where it existed before liberation. In areas where fighting has recently taken place it is particularly difficult to restore the disrupted distributive system. The combined military authorities are, however, making special efforts to effect such improvements as are possible in present conditions. At the present time I do not think there would be any advantage in issuing a white-paper on these matters.

Earl WINTERTON: In view of the fact that independent evidence completely contradicts what the Minister says, and is to the effect that millions of people are on the verge of starvation and in a [illegible] occupation, how c[illegible] and is it not the [illegible] want to avail themselves of leave trains or NAAFI supplies, if they were doing so at the expense of starving French babies?—Mr. ATTLEE: The question is based on an assumption which is entirely groundless.—Earl WINTERTON: It is not.—Mr. ATTLEE: There are [illegible] with the supply of commodities. [illegible] on the facts known to us from [illegible] received on conditions. I agree [illegible] would wish them to be, but there is really no point in making exaggerated statements.

Mr. A. H. E. MOLSON: Are we to understand from the Deputy Prime Minister's reply that this immensely important matter of the relief of great civilian populations is left to the military authorities? Is not this a political issue of the utmost importance?—Mr. ATTLEE: Statements have been made as to the arrangements made. There is a period in which this is dealt with by the military authorities, and later on it passes to the civil authorities.

Mr. A. BEVAN: Is the Minister aware that very large quantities of foodstuffs have been stolen both in France and in Belgium, largely as a consequence of the appalling conditions of the civil population, and that the provision of adequate food-supplies for the civilian population would enable cigarettes to reach our own troops in the front line; also that this conflict between the military and civil situation in France and Belgium is causing the prestige of this country to go down and is interfering with the war effort?—Mr. M. PETHERICK: Does the Minister realise that public opinion is really disturbed here, and that it is quite unnecessary to exaggerate, as everybody understands the difficulties—the blown-up bridges all over the Continent and all those kind of difficulties—and could he seek some opportunity of telling the House what is being done?—Mr. ATTLEE: I will consider an opportunity for making a full statement. It is obviously impossible to deal with every point that is made by question and answer. I have stated, and everybody must realise, the difficulties and the effect of them, but that is no reason to make what I venture to say is a too widely-extended statement.

Maternity Services in Glasgow

Major E. G. R. LLOYD asked the Minister whether he intended to continue to permit the Glasgow corporation to remain outwith the provisions of the Maternity Service Act (Scotland) 1937; and was he aware that Glasgow was the only large local authority in Scotland which had not implemented the provisions of this Act.—Mr. JOHNSTON replied: Proposals under the Act which were submitted by Glasgow corporation in September 1939 and which provided for a service of whole-time doctors and midwives were not proceeded with because of difficulties of obtaining staff in war-time. The period for submitting proposals has been extended from time to time and I am extending the period until June 30, 1945. I am, however, in communication with the corporation about their interim arrangements. Two other local authorities have not made arrangements under the Act and in two other areas the local authorities have not been able to bring into operation arrangements which have been approved.

Payments to Pensioners in Hospital

Mr. G. S. SUMMERS asked the Minister of Pensions if he would amend the regulations governing the payment of disability pensions to men still in hospital, so as to enable them to draw the full amount to which they were entitled, after taking account of maintenance charges, thus putting an end to the practice of accumulating sums to be handed over on release from hospital.—Sir WALTER WOMERSLEY replied: I do not share the view that it is undesirable to accumulate a balance for the man's assistance on his discharge from hospital, but in any event there are good medical grounds for limiting the amount of pocket money available to patients under treatment.

Medical Certificates for Coal

Dr. E. SUMMERSKILL asked the Minister of Fuel and Power whether he was aware that medical certificates recommending delivery of coal for people seriously ill were not receiving attention; and if he would take steps to remedy this matter. —Major LLOYD GEORGE: I regret that a number of cases have come to my notice where, notwithstanding instructions, or directions, given by the local fuel overseer, there has been delay in the delivery of coal to cases supported by medical certificates. I have taken steps to ensure that deliveries are made promptly to such cases.

Sick-leave Certificates

Mr. W. FOSTER asked the Minister of Labour if he will consider abolishing the practice by which employers in many districts compel employees to produce medical certificates when off sick for one or more days, for which a charge is made by the doctors, and under which evidence of sickness is not accepted by the magistrates in prosecutions for absenteeism by his Ministry under the Essential Work Orders unless supported by medical certificates, or else relieve employees in such cases of the cost of medical certificates.—Mr. E. BEVIN replied: I have no power to prohibit employers from asking for medical certificates in support of absence. Arrangements have been agreed with employers' organisations, trade unions, and the medical profession under which a certificate in standard form can be obtained for 1*s*.

PRIORITY MILK.—Mr. MABANE estimated the number of people other than expectant mothers and children up to the age of 5 who are entitled to priority supplies of milk as about 9·1 millions.

MEDICAL FILMS.—The film programmes arranged by the Scientific Films Association will take place on the fourth Wednesday (not Thursday) in February, March, April and May, at 1, Wimpole Street, London, W1. Each programme will be given at 5.30 PM and again at 8 PM, and will contain examples of a general-interest introduction, a specialised illustration, a direct teaching film, and a broad discussion of a subject. Application for admission should be made to [illegible] Reynolds, 14, Hopton Road, SW16.

Letters to the Editor

A CHAIR OF PSYCHIATRY

SIR,—In your last issue you announce the decision the London County Council to separate the chair psychiatry at London University from the superi tendentship of the Maudsley Hospital, and to appoint director of clinical psychiatry. It is stated that "Th new director's appointment, which is to be condition on concurrent appointment to the university chair, wi date from Sept. 1 next." This statement raises tw issues, both of importance.

Firstly, is it correct to assume that *all* the cream of th medical profession remains in this country and is avai able to apply for this post? There are thousands doctors overseas in the Forces and they include hundre of psychiatrists. It is reasonable to believe that amon them there may be one or even two candidates as goo as, or may be better than, any of those of us who ar at home. The bulk of Service medical officers oversea can probably not hope for release to civil life unt Japan is defeated, which is unlikely to take place befor Sept. 1. Does the LCC realise the fund of bitterness is being stored up among doctors overseas by what feel to be the filling of important appointments b their backs? Will the LCC ensure that such doctors hav ample opportunity to apply for this post, and that if on of them is selected it will be held open for him until can be released to civil life?

This leads to the second point. There are only tw chairs of psychiatry in the United Kingdom, and Goodenough Committee, two out of three of whos psychiatric witnesses came from the schools at these chairs exist, recommended that the responsibilit for postgraduate teaching of psychiatry in this should be restricted to these two schools. Your leading article of Nov. 25 last echoed the doubt th many of us feel of the wisdom of setting up in this way narrow psychiatric orthodoxy. Be that as it may, on any count the choice of the new professor in London of great importance. Your announcement suggests th the LCC is prepared to pay him provided that the University of London accepts their nominee. It seem a curious way of choosing one of the two trustees o British psychiatry, especially in view of the LCC te dency to fill its senior posts from within its medic service. The medical profession has recently plain its alarm at the possibility of medical prac being controlled by local authorities. There seems to cause for equal alarm in the possibility of all po graduate psychiatric education south of the Tweed put in the hands of the nominee of *one* local authority

SERVICE PSYCHIATRIST.

A NEW DPM

SIR,—I have read with great interest your annotati of Feb. 3 on the report of the committee on psych medicine of the Royal College of Physicians. It encouraging that a body of this nature should set suc high standard for psychological medicine by a five-years course of training after the necessary me qualifications and house-appointments.

According to the syllabus as detailed, the first years is split into varying periods of whole-time s of what may be termed preliminary subjects (anat physiology, pathology of the nervous system, &c.) short periods of clinical study—three to eighteen —in various fields such as neurology, psychiatry, industrial psychology. At the end of this three the candidate will take his examination; and after he will spend two years in study at approved in of any branch, or branches, of psychiatry or ne On completing the last two years to the satisfa the examiners he will receive his diploma and be r nised as a specialist. But a specialist in what? cannot be a specialist in the whole field of psyc medicine, and two years' special study in any one is surely inadequate—even though there may be previous knowledge of the subject—for the high s which the new DPM should confer.

No mention is made of any psychological examin of the candidate as to his mental fitness for his career. My experience has shown me that number of people take up "psychology" either consciously or unconsciously because they hope to find in the work some satisfactory solution for their own internal personal problems. Unfortunately it seldom works out this way; for until the individual has faced [illegible] will be a barrier to [illegible] rotic patient; and they may [illegible] factor which makes [illegible] cal or chemical forms of [illegible] of pursuing the rational [illegible] patient by psychological [illegible]

[illegible] the annotation that the DPM will bear any indication of what branch of psychology the candidate has taken for special study and for which he is presumed to hold the specialist qualification to practise. Unless this is framed specifically, there will be nothing to prevent the man who has taken his DPM in say neurology from practising psychological treatment or taking a post as an industrial psychologist.

D. N. HARDCASTLE.

ALKALI FOR CRUSH INJURIES

SIR,—In the second edition of *War Memorandum* No. 1 [illegible] Research Council, it is [illegible] "all cases should be [illegible] oz.) hourly by mouth [illegible] e, but not for longer [illegible]

[illegible] to mislead anyone [illegible] bicarbonate hourly [illegible] it we consider that [illegible] led to recommend, [illegible] potentially dangerous [illegible]. We have drawn attention [illegible] to the fact that the administration of alkali to patients with kidneys already functionally impaired, as they may be in crush injury, may lead to disaster, and [illegible]

[illegible] recommended in the Memorandum may result after 24 hours in retention of sodium and water, indicating that even a normal kidney [illegible] unable to excrete alkali at this rate.[2]

The high dosage recommended in the Memorandum [illegible] the more surprising since the authors themselves apparently feel that the rationale of the treatment is not yet established. In fact, recent work has shown that there are serious difficulties in accepting the theories on which it is based.[3] We are not prepared to say that alkali in small doses does no good, but we believe that in [illegible] doses recommended it is dangerous.

School of Tropical Medicine,
Liverpool

B. G. MAEGRAITH
R. E. HAVARD.

AN INDUSTRIAL HEALTH SERVICE

SIR,—I am pleased to find myself in agreement with your leader of Feb. 3 on the plan of the Royal College of Physicians for [illegible]

[illegible] administrative problems. Nevertheless, in answer to your suggestion that alternative plans [illegible] administ [illegible] forward, I hereby [illegible]

[illegible] s in its implication [illegible] services are to be controlled by the local authorities through the Ministry of Health, as this is now constituted. That means that factory inspection is to [illegible] under the control of local councils, some of whose members are bound to be interested in one way or another [illegible] the factories. Instances could be given to support [illegible] view that the administration of the Factories Act [illegible] all the better for being divorced from local politics [illegible] influence." It would be a retrograde step to give [illegible] local authorities control over the factories, even at the risk of spoiling the plan for coordination of all health ser [illegible]

[illegible] the [illegible] offi [illegible] administration of which is to be delegated to the Ministry of Labour and National Service. As you say, it would be much more satisfactory to place all the civilian health services under a single ministry. But what Ministry is to control them? The Ministry of Health in its present form has a local-authority bias, and the Ministry of Labour until recently has been concerned only with employment and kindred problems and not with industrial health. Neither Ministry in its present form is ideally constituted to control industrial health matters. In this connexion it might be added that we are liable to be bluffed by mere words. Just because one Ministry is labelled "health," it does not necessarily follow that it is the repository of all wisdom, knowledge, and experience of health matters; and on the other hand a Ministry called "labour" is not simply on that account the ideal place for the central control of industrial health affairs.

What is the alternative solution? I think that a reformed Ministry of Health is the best place for the [illegible] rial health as well as the other [illegible] But it must be a reformed [illegible] clearly laid down that adminis- [illegible] Act and the industrial health services should be centrally and not locally controlled. The direction should be in the hands of a joint board composed of the chief medical officer for "local authority" public health, CMO for industrial health, and CMO for Mines, Post Office, and so on. Each of the CMO's might be chairman of the board in turn for a year or other suitable period, and of course each of them should *direct his own show*. I think that the coordination of the medical services would be better secured in this way than by having one branch dominating the others. Further, the administration should be overhauled to allow medical men to control medical matters, and to eliminate or modify the present lay control. If this were done I firmly believe that the interests of the public and their health would be better secured.

CICERO.

PENICILLIN IN BACTERIAL ENDOCARDITIS

SIR,—The place of penicillin in the treatment of subacute bacterial endocarditis has not yet been established, although encouraging results have been reported in America, and these suggest that prolonged treatment with large doses may be effective in some cases. It is apparent that more information is required on the effective dosage in relation to the sensitivity of the organism to penicillin, and the Penicillin Clinical Trials Committee of the Medical Research Council has therefore established ten centres in which patients will be treated according to a prepared plan, and with full laboratory control. Physicians are invited to refer patients suffering from subacute bacterial endocarditis to any of the following:—

London
(a) Sir Alexander Fleming,
St. Mary's Hospital,
London, W.2.
(b) Resident Medical Officer
Middlesex Hospital,
London, W.1.
(c) Prof. R. V. Christie,
Hill End Hospital
(St. Bartholomew's)
St. Albans.

Liverpool
Prof. Henry Cohen,
Department of Medicine,
The University,
Liverpool, 3.

Sheffield
Prof. E. J. Wayne,
Royal Hospital,
Sheffield, 1.

Leeds
Dr. J. R. H. Towers,
43, Park Square,
Leeds, 1.

Manchester
Resident Medical Officer,
Manchester Royal Infirmary,
Manchester, 13.

Bristol
Prof. C. Bruce Perry,
Department of Medicine,
Canynge Hall,
Whatley Road,
Bristol, 8.

Edinburgh
Dr. A. R. Gilchrist,
Royal Infirmary,
Edinburgh.

Belfast
The Secretary,
Belfast Penicillin Clinical
Trials Committee,
Queen's University Institute of Pathology,
Grosvenor Road,
Belfast.

RONALD V. CHRISTIE,
Secretary, Penicillin Clinical Trials
Committee.

Maegraith, B. G., Havard, R. E. *Lancet*, 1944, ii, 338.
Report to Malaria Committee, Medical Research Council, No. 2[illegible], December, 1944.
[illegible] J. H., Smith, A., Barnes, H. D., Knoll, A. *Trans. R. Soc. trop. Med. Hyg.* 1943, 36, 197.

EXUDATIVE TONSILLITIS

SIR,—As Dr. Clarke observes in your last issue. I had not read Neubauer's paper on clinical signs of diphtheria in inoculated children (*Lancet*, 1943, ii, 192). My attention was afterwards drawn to it, but I am bound to say that, having read it carefully, I am not fully convinced that diphtheria in an immunised child may manifest itself as a follicular tonsillitis.

I have rearranged the list of the 49 cases of diphtheria in Dr. Neubauer's paper as follows:—

Throat lesion	No. of case	Fœtor	Glands	Œdema	Nasal discharge	Complications
(*a*)	3	..	1	..	1	None
(*b*)	9	1	3	..	..	8 none. Myocarditis 1
(*c*)	7	..	..	..	..	6 none. Peripheral neuritis 1
(*d*)	11	5	7	7	1	9 none. Peripheral neuritis 2
(*e*)	9	5	6	..	1	None
(*f*)	10	6	4	4	2	Paralysis 2. Peripheral neuritis 1. Myocarditis 5

Although it will be necessary to refer to the original article for a proper understanding of the position, categories (*a*) and (*b*) include cases of what would be regarded clinically as follicular tonsillitis. What evidence is there that they suffered from diphtheria? Fœtor, glands, and nasal discharge are somewhat equivocal signs. One patient admittedly developed myocarditis, but myocarditis is not exclusive to diphtheria: for example, streptococcal tonsillitis, acute rheumatism, and influenza may give rise to this complication. At the other end of the list (*f*), the clinical findings and the complications are in conspicuous contrast, and the diagnosis of diphtheria could not be questioned.

I feel that in all this there is a principle at stake. If we are to accept as diphtheria every child with follicular tonsillitis who happens to have a positive swab, we are playing into the hands of those who, for reasons best known to themselves, attempt to decry diphtheria immunisation. If it can be proved that, in an immunised individual, infection by the *Corynebacterium diphtheriæ* leads to the production of a follicular exudate instead of membrane, we must accept that. But, as I said before, I am not yet convinced.

W. ALCOCK,
Burton-on-Trent. Medical Officer of Health.

A FACULTY OF OPHTHALMOLOGISTS

SIR,—As chairman of the organising committee of the Faculty of Ophthalmologists I have been asked to write a reply to Mr. Lionel Green's letter.

Mr. Green's criticisms of the Council of British Ophthalmologists and its activities contain many inaccuracies. The origin and constitution of that body were stated in the preamble to the announcement of the formation of the Faculty published in your issue of Feb. 3. Mr. Green states that the CBO has had a purely nominal existence unknown to the mass of ophthalmologists. This statement shows a surprising ignorance of the facts. Every member of the Ophthalmological Society of the United Kingdom, which has between 500 and 600 members, has received each year, with only two exceptions early in the present war, a notice of a meeting, open to all ophthalmologists, to receive and discuss the annual report of the CBO. His statement implies, therefore, that the "mass of ophthalmologists" are not members of the leading scientific ophthalmological society in the country!

The annual reports, and a very large number of special reports, have been published in the *British Journal of Ophthalmology*; so one must assume that Mr. Green's "mass of ophthalmologists" do not read the journal devoted to their specialty.

Had Mr. Green heard or read these reports he would have learned that the CBO has had a far from purely nominal existence, and, among many other activities, has played a leading part in negotiations with Government with regard to optical benefits under National Health Insurance Act, and in opposing attempts of sight-testing opticians to obtain statut recognition.

He is quite mistaken in supposing that a resolut passed by the council of the Association of Brit Ophthalmologists had anything whatever to do w the initiation of the plan for the formation of a Facu Many members of the CBO had long felt that sc change in its constitution was advisable, and propo were under discussion as early as the summer of 1 In March, 1943, the CBO appointed a committee study the question and prepare a scheme for reform reconstitution. This committee was given power coopt any persons whose collaboration it conside would be useful. It decided to obtain, if possible, cooperation of the ABO, and therefore invited council of that body to send representatives to meetings. Several meetings were held with th representatives, and although a considerable meas of agreement was reached, negotiations finally br down when it became apparent that the ABO wo not accept any scheme which ensured that a majo of the executive council should be elected by per of real consultant status, a condition which the C considered of vital importance.

London, W1. W. H. McMULLEN

DECOMPRESSION FOR RETENTION

SIR,—I read with great interest Mr. Cox's paper Feb. 3 on bladder decompression and its control cystometric pressure readings. He recommends as ideal "flexibility of decompression based on the int vesical pressure." I would submit that this has b attained for many years by the simple method of deco pression, based essentially on cystometry, which I f learnt in Newcastle-on-Tyne from Prof. R. J. Will It is eminently satisfactory in practice, and cons in attaching a sterilised rubber tube and U-shaped gl tube to an indwelling catheter and hooking the invert U-tube over the side of a can which is attached to vertical stand at the bedside. By adjusting the hei of the can the rate of flow of urine can be controlled desired. Such an apparatus is the equiv[illegible] stantly attached cystometer, and in the [illegible] added advantage that it is easy for [illegible] nursing staff to control.

London, SW17. HENRY K. VERNON

DIAGNOSIS OF PRIMARY CANCER OF THE LIVER

SIR,—In a recent article on cancer of the liver the negro in Africa and America, Professor Kennaw drew attention to the fact that "primary cancer of liver is at the best a bad subject for mass statistics account of the danger of inclusion of metastases fr undetected primary tumours elsewhere." Observati which I made several years ago may be of interes this connexion, suggesting a possible method of differ tiating during life between primary and second tumours of the liver.

In a study of the lactic acid content of the blood normal subjects and those suffering from differ diseases including cancer[2] (using the methods of Frie mann et al.[3] and of Mendel and Goldscheider[4]), nor values (9–15 mg. per 100 ml.) with occasional variat not exceeding 100% were obtained in most of the eased cases studied, including cancer cases, some of with extensive metastases in the liver. The only ex tions were 3 cases of primary carcinoma of the (confirmed at autopsy), which gave values 5–10 the normal (60–130 mg. per 100 ml.) on repeated exa tion. Similar examination of the urine in 2 of the c indicated also an increased excretion of lactic acid

While the small number of primary cancers of liver encountered in a European community [illegible] a more extensive follow-up of the problem, the str

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1. Kennaway, E. L. *Cancer Res.* 1944, 4, 571.
2. Schöntal, R. *Polska Gaz. lek.* 1938, 17, 1011.
3. Friedemann, T. E., Cotonio M., Shaffer, P. A. *J. biol.* 1927, 73, 335.
4. Mendel, B., Goldscheider, I. *Klin. Wschr.* 1925, 4, 1502

esults obtained suggested the possibility of the method eing useful as a differential test.

The work was carried out at the university clinic [illegible] with cancer laboratories in Cracow. The [illegible] re published in a Polish medical journal which [illegible] nately not available here.

REGINA SCHOENTAL.

SAFETY IN THE HOME

SIR,—Your note of Feb. 3 on home accidents was indeed timely. There is no doubt that far too little attention has been given to accident prevention in that most important of all workshops—the home. As you [illegible] s in the dual approach of educa-[illegible] better conditions. [illegible] little is done to educate people [illegible] the home is perhaps hardly just [illegible] to the National Home Safety Committee of the Royal Society for the Prevention of Accidents, which, centrally and through a number of area committees, has for some [illegible] to maintain [illegible] nphlet, press [illegible] nference, the urgency of the question is stressed, and now attempts are being made to use the film as an ally in the campaign.

What is needed is more support for the work. The committee are especially anxious to secure the goodwill of medical officers of health, who have in the machinery of their departments such excellent means of reaching the mothers. Talks in clinics, infant welfare centres, and the like have been found most useful, and the more they are multiplied the greater the chance of reducing this disastrous toll.

ETHEL WILLANS,
Chairman, National Home Safety Committee.

Royal Society for the Prevention of Accidents, Grosvenor Gardens,
London, SW1.

Public Health

Milk in Cartons

WELL over 90% of the liquid milk sold to the domestic consumer in this country reaches him in glass bottles. At a recent meeting of the Society of Dairy Technology,[1] the important question of the standardisation of the milk bottle was discussed. As is well known, there is wide variety of shapes, sizes, and types of bottle. This ariety [illegible] he processes filln [illegible] chines, the ype a [illegible] packing for ranspc [illegible] and in so ping [illegible] e ultimately by the onsur [illegible] k. At t [illegible] hat much advantage as t [illegible] number of existing types of bottles and by standardising each size. A type of closure completely covering the mouth of the bottle [illegible] which [illegible] dustries [illegible]

The total number of milk bottles in circulation at any one time must run into scores of millions. The commonest size, the pint bottle, weighs 18–20 oz.; so the distribution of 20 oz. of milk means that an extra weight about equal to the weight of the liquid itself has to be transported to the consumer's house and later carried back to the distributor's premises.

The drawbacks of the milk bottle are manifold. Initially heavy and costly, requiring to be recovered after use from the consumer, needing special machinery which, in the large-scale distributing dairy, is of vast size and complexity *and requires skilled and constant* supervision to obtain regularly hygienic results, calling for care in handling to avoid an unduly large proportion of breakages, it also has the disadvantage from the distributor's point of view of being of a convenient size and shape for many alternative uses in the household.

Why has not the non-returnable carton superseded ? Does the huge investment of capital already made by our major dairies in bottles, bottling and bottle-washing machinery, crates and containers to fit the bottles, inhibit a change which would mean scrapping of much valuable plant and an outlay, by no means negligible, for cartonning machinery? The modern waxed paper carton is relatively cheap, very light in weight, but *strong and almost sterile*; it needs no costly recovery service, no machinery for cleansing, and when dried it makes an excellent firelighter! It is said to be easier to measure with exactness the quantity of milk delivered into a carton than into a bottle. Whilst the colourless glass bottle gives little protection against the *steady destruction by light of the vitamin C* in the milk contained in it, the carton gives greater, though still not complete, protection.

We cannot give the complete answer to these questions, some of which are touched upon in a recent commercial publication.[2] Perhaps the cost of the tough modern bottle divided by the *surprisingly large average* number of journeys—said to be 40 to 80—that it makes, is so small as to outweigh economically the apparent advantages of the single-journey carton. Reduction in the number of [illegible] and types migh [illegible] the relative pc [illegible] ife's point of vi [illegible] van-tage of sh [illegible] ough dubious in [illegible] In war-time, allocation of the imported raw materials, especially paraffin wax, needed for extensive carton manufacture may be difficult or impossible, whereas materials for glass manufacture are nearer home.

Presumably the carton manufacturer is continually [illegible] equally tough types of [illegible] ethods of impregnation, [illegible] to try a really large experiment, possibly in several areas, to ascertain the relative costs of milk distribution by bottle and by carton. Attention should at the same tin [illegible] ing and [illegible] instead [illegible] large cit [illegible] of bottles, and it is more than 13 years since London medical officers of health were given an impressive demonstration by Bladen Dairies in Dorset.[3]

Even during the war a particularly good case can be made out for the use of cartons in the distribution of tuberculin-tested (or tuberculin-tested pasteurised) milk by a producer-retailer who wishes to avoid the complication and hygienic difficulties of handling bottles on a relatively small scale.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED FEB. 3

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1401; whooping-coug [illegible] paratyphoid, 2; typhoid, 4; [illegible] 10,039; pneumonia (prim [illegible] puerperal pyrexia, 130; [illegible] poliomyelitis, 5; polio-encephalitis, 1; encephalitis lethargica, 1; dysentery, 376; ophthalmia neonatorum, 67. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Jan. 31 was 1014. During the previous week the following cases were admitted: scarlet fever, 31; diphtheria, 20; measles, 93; whooping-cough, 28.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 11 (0) from measles, 13 (3) from whooping-cough, 1 (0) from diphtheria, 68 (4) from diarrhoea and enteritis under two years, and 80 (8) from influenza. The figures in parentheses are those for London itself.

Birmingham reported 7 deaths from diarrhoea. There were 3 fatal cases of whooping-cough at Liverpool.

The number of stillbirths notified during the week was 109 (corresponding to a rate of 29 per thousand total births), including 11 in London.

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[1] *Dairy Industries*, 1944, 9, 720.

[2] The Nation's Milk. With a foreword by Lord Perry. Press Ltd., Gateshead. 2d.

[3] *Lancet*, 1931, ii, 1056.

MINIATURE RADIOGRAPHY IN LANCASHIRE

A FIRST report on the results of mass radiography has been made to the Lancashire county council by the county tuberculosis committee. The three surveys made covered the staff of a mental hospital, the employees of a large industrial undertaking, and the employees of an Ordnance factory—10,730 people in all. Subjects were examined voluntarily, the results were confidential, and no action was taken without the consent of the person concerned. Of 873 in whom abnormalities were found, all except 31 accepted an invitation to have a full-size film taken.

Abnormal findings could be classified as follows: abnormalities of the lungs and bony thorax, 57; chronic bronchitis and emphysema, 45; non-tuberculous bronchopneumonia, 1; bronchiectasis, 17; non-tuberculous fibrosis, 35; pneumoconiosis, silicosis, asbestosis, 7; basal fibrosis, 39; pleural thickening, 16; non-tuberculous effusion, 5; cardiovascular lesions, congenital 8, acquired, 54; tuberculosis, active 36, inactive 401; miscellaneous conditions, 19.

Of the 36 cases of active tuberculosis (3·3 per 1000 examined), 12 had positive sputum (1·1 per 1000). Sanatorium treatment was accepted by 26, 6 were placed on the dispensary register for supervision, 2 were referred to their own doctors, and 2 refused treatment. Judging by these results, and reckoning that there are half-a-million people working in factories in the whole administrative county, the writers of the report estimate that there are some 500 undiscovered cases with positive sputum in this population section. Mass radiography provides the means for their detection at a time when the chance of successful treatment is good.

A PLAN FOR BATH

AN exhibition is in progress at the Victoria Art Gallery, Bath, illustrating a plan for the next fifty years prepared by Sir Patrick Abercrombie, FRIBA, and the city's engineer and town-planning officer. It is based on a "community of Bath" consisting of 14 "neighbourhoods" and 13 parishes or parts of parishes fringing the present city boundary. An increase of population from 78,500 to 81,000 is allowed for. An area almost as large as the ancient Roman town is set aside as a health centre which will have spacious gardens and will include the Royal National Hospital for Rheumatic Diseases, accommodation for research, and hostels. The development of this area as a centre of healing and combat against rheumatism is described as "the finest gesture of modern Bath to the world." The city's "healing waters are to be made available to the greatest number of people at the lowest cost."

ORANGE-JUICE JELLY

THE Minister of Education, after consulting with the Minister of Food, is providing school canteens and residential schools with a limited quantity of orange-juice jelly. The vitamin-C content of the jelly will vary with that of the orange juice of which it is made, and the time it has been stored. The average potency expected is 17 mg. of vitamin C per oz. and the minimum potency (declared on the labels) will be 12 mg. The Minister wisely notes that the jelly is popular with children so long as it is not served too often; about an ounce a week is thought to be a suitable dose. It tastes strongly of orange, and can be used like marmalade. The cost is expected to work out at about ½*d.* per child per week. A number of appetising receipts are proposed for its use.

Royal College of Surgeons of England

At a meeting of the council held on Feb. 8, with Sir Alfred Webb-Johnson, the president, in the chair, Mr. Ernest Finch, of Sheffield, was elected a member of the court of examiners for three years. The Association of Municipal Specialists was admitted to the joint secretariat under the auspices of the college at No. 45, Lincoln's Inn Fields. Mr. McAdam Eccles was reappointed a representative of the college on the British Social Hygiene Council for 1945.

Diplomas of membership were granted to Diana M. Beyts, R. M. Laslett, W. D. G. Tellam, and to the candidates named in the report of the comitia of the Royal College of Physicians in our issue of Feb. 3, p. 165 (with the exception of R. A. Allen, F. Z. L. B. James, H. B. Marsden, and J. Sharp).

Royal College of Physicians of Edinburgh

At a meeting of the college held on Feb. 6, with Dr. A. Fergus Hewat, the president, in the chair, Dr. W. F. T. Haultain, took his seat as a fellow. Dr. D. R. Maitland (Cupar, Fife) d Dr. Ian Douglas-Wilson (Harrogate, Yorks) were elected the fellowship.

Dr. W. T. RITCHIE, formerly president of the College of Physicians of Edinburgh, and emeritus professor medicine in the University of Edinburgh, died on Feb. 7. was in his 72nd year.

University of Sheffield

Mr. E. F. Finch, FRCS, has been appointed h lecturer in the history of medicine, Dr. W. J. W. Sha temporary demonstrator in anatomy, Dr. J. Carson hono lecturer in psychology, Dr. C. H. Rosenberg tutor for d of children.

Royal College of Physicians of Ireland

At a meeting held on Feb. 2 Dr. R. H. Micks was King's professor of materia medica and pharmacy. T following were admitted licentiates and members of th college: Dr. J. D. Kennedy, Dr. Anne McMahon, Dr. W. F O'C. C. Powell, and Dr. Robert Wilson.

Post-war Smoke Abatement

The Institute of Fuel and the National Smoke Abate Society *are holding a joint conference on this subject* London on Feb. 23, when Major Gwilym Lloyd George, *the Minister of Fuel and Power, will be the opening*

British Council Meetings at Birmingham

Dr. J. F. Brailsford is giving a series of talks at the University Overseas Club, 5, Great Charles Street, Birmingham, on Sundays at 7.30 PM. He is speaking on diseases of bones and joints and on Feb. 18 he will discuss def diseases, on March 4 trauma, on March 18 inflammatory conditions, on April 15 simple tumours, and on April malignant tumours.

Royal Sanitary Institute

At a meeting to be held at Radiant House, Bold Stre Liverpool, on Saturday, Feb. 24, at 10.30 AM, Dr. C. O Stallybrass will speak on public health and the social servic

Nutrition Society

On Saturday, Feb. 24, at 11 AM, at the London School of Hygiene, Keppel Street, WC1, the society is holding conference on factors affecting the nutritive value of human food. Dr. R. A. McCance and Miss E. M. Widdowson, PH D, are speaking on percentage extractions and composi of flours, Miss Harriette Chick, D SC, and Miss A. M Cop on the nutritive value of different types of flour, Mr. D. Kent-Jones, PH D, on enrichment, Prof. H. D. Kay, D SC, the value of wheat offals for milk production, Mr. E. T Halnan on the value of wheat offals for pigs and poultry, a Prof. J. A. S. Watson on the best use of wheat for man needs.

Royal Society of Medicine

The section of pathology is holding a laboratory meeting the London Hospital, E1, on Tuesday, Feb. 20, at 4 30 P On Feb. 21, at 1, Wimpole Street, W1, at 2 PM, at the section comparative medicine, Mr. H. T. Matthews, Dr. W. A. Lethe and Mr. Clyde Higgs will open a discussion on the veterinar and *medical control of the milk-supply*. On Feb. 22, 5 PM, at the section of urology, there will be a discussion on radiotherapy of tumours of the kidney and bladder, when Air Commodore Stanford Cade and Mr. G. F. Stebbing will be the opening speakers. On Feb. 23, at 3 PM, at the section epidemiology and state medicine, Colonel P. G. Stock speak on the International Sanitary Conventions of 1944. the same day, at 4.30 PM, at the section of disease in childre Prof. Robert Debré will describe the condition of children France under the occupation.

LEWIS'S LIBRARY.—Messrs. H. K. Lewis (136, Gower S London, WC1) have published a new edition of the catalo of their library, revised to the end of 1943. The volume cost subscribers 12*s.* 6*d.*, but others will have to pay 25*s.*

Appointments

ANSELL, ISAAC, MB LPOOL, MRCP: asst. physician, Liverpool Hospital for Consumption.
CLARKE, J. A., MRCS: RSO, London
FORSTER, T. W., MRCS: temp. asst. M
HULL, E. R., MB BELF., DPM: me Eastern Counties Institution for

in short supply owing
per should not be taken
y available for export.

AVIATION MEDICINE*

Sir Harold Whittingham
KCB, KBE, MB GLASG., LL D, F R C P, K H P
AIR MARSHAL; DIRECTOR-GENERAL OF MEDICAL SERVICES, ROYAL AIR FORCE

Being naturally interested in the great American doctor in whose illustrious name I am being honoured on this occasion, I find, from studying his record, that John Jeffries of Boston is an example of a type which never fails to emerge in American history—a man of

of his time, as were

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had close ties with

under that world-

d he obtained the

rdeen University in

1769, being the first American to receive this distinction. From 1771 to 1774 he served as assistant surgeon in a British Navy ship and at a naval hospital ashore. He then saw service in British

from 1775 to 1779, and later

at Savannah and Charlesto

Force existed then he would have served with it also; probably it would have been his first and last love.

Settled for some time in England after the War of Independence, Jeffries, a keen meteorologist, was the first medical man to study aviation medicine. In November, 1784

ascent over

Jean Pierre

the first record of scientific data of free air at 9000 feet above sea-level. It can also be claimed that John Jeffries was the first man to drop leaflets from the air, having received the quaint notion of dropping greeting cards to his many admirers below, during his flight over London.

In January, 1785, Jeffries and Blanchard made their epic balloon flight across the English channel, reaching the coast of France within two hours, after jettisoning practically all their equipment, scientific and otherwise, including most of their own clothing. Within another hour they landed near the historic Field of the Cloth of

showing that Jeffries' training in Aberdeen had indeed thorough. This was also the beginning

n exploit is enshrined in the story

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only to specially distinguished men; the present holder being our Prime Minister, Mr. Winston Churchill.

ANGLO-AMERICAN RESOURCES POOLED

Fortunately, the liaison in matters of aviation that existed between our two countries some 160 years ago, inaugurated by Dr. John Jeffries, has been extended during recent years in proportion to the remarkable progress made in aeronautics. Early in 1939 I had the privilege and pleasure of visiting the United States of America to see the high lights of aviation and its associated researches. I visited 12 States and was particularly impressed by the fine work done at Wright Field, in Dayton, by Colonel (then Captain) Harry G. Armstrong. I returned to the United Kingdom determined to build up as far as was in my power an aviation medical research

other way round, as had so long been the case owing to insufficient cooperation between the engineering and medical groups. That was a defect which this Institute has done much to eradicate.

Since 1939 there has been the closest and happiest liaison between British and American research centres and workers, both Service and civilian, including your National Research Council. To our mutual benefit, members of research groups from both countries have visited each other, and continue to do so, to study and discuss various problems first hand. Thus on either side of the Atlantic and in the field, America, Britain, and Canada have pooled their knowledge and resources in aviation

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How to provide an adequate supply of oxygen, with the maximum of comfort, at all oxygen-requiring heights under the most adverse conditions.

How to protect aircrew against cold and the occurrence of frostbite, which has now been reduced to negligible proportions (1 case in 2000 bomber sorties; that is, 1 case in 12,000 individuals engaged in these sorties) by the provision of suitable clothing, particularly electrically heated garments.

How to prevent blacking-out in combat during high acceleration without interfering with pilot-readiness, active movements, and performance under all climatic conditions.

How to guard the eyes against the glare of the sun and searchlights, without reducing the field of vision or visual acuity, and how to obtain and maintain the optimum night vision under various flying conditions.

How to deal with such stratosphere problems as the prevention of bends, the physiological requirements in pressure cabin design and development, including explosive decompression and baling out from aircraft at altitudes over 30,000 feet.

How to lessen fatigue, which is such a potent factor in the causation of air accidents.

How to improve

How to protect those in cockpits and cabins of aircraft against the possible entry of noxious substances, such as exhaust gases or hydraulic fluids.

How to prevent air-sickness, particularly among paratroops.

In addition a considerable amount of research and development has taken place in connexion with air-sea rescue, and last but not least, the evacuation of casualties by air.

The United States Army Air Force has done a stupendous job in this global war in evacuating casualties by air from all fronts to overseas bases and to the United States. Major General David N. Grant, your Air Surgeon, deserves the greatest credit for this wonderful achievement, as he does also for the gigantic strides that your country has made in aviation medicine during this war.

The British endeavour, as regards evacuation of casualties by air, has been less only in proportion to the

the Royal Air Force alone

300,000 cases of sick and

personnel, on all fronts—the Far East, the Mediterranean and in Europe proper—without a single mishap, although this evacuation involved some 20,000 separate flights and much of the flying was done from forward landing-strips near the enemy, over jungle, mountains, and sea in all sorts of weather.

HAZARDOUS INVESTIGATIONS

I should now like to pay tribute to certain medical men of both countries who have done outstanding work for aviation. Some of our theoretical calculations of the effects of stratosphere flying on man have proved to be wrong; certain hazards were overstressed, others were underestimated with resulting casualties. In 1941, during the experimental phase of adapting

feet. Stewart was the sole survivor. up at an altitude of some

Colonel Randy Lovelace, of the US Army Air Force, in 1943 purposely and courageously baled out at 40,000 feet to make physiological observations in a parachute descent from such an altitude. He became unconscious almost immediat [illegible] suffered severe frostbite of the [illegible] y landed safely. Only last year another distinguished American research-worker, Colonel Boynton, met his death doing an experimental delayed parachute drop from 44,000 feet, though he knew the hazards. He was a very brave man and a great loss to science.

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* Part of the speech made in acknowledging the John Jeffries award of the Institute of Aeronautical Sciences of the USA on Jan. 31. The first three holders of the award have all been Americans—Harry Armstrong, L. H. Bauer, E. C. Schneider, and [illegible]

Again, Squadron-Leaders J. C. Gilson, Pask, and Stewart carried out a series of dangerous experiments—to find out how long man could live during a parachute descent without additional oxygen—in rarefied atmospheres similar to those between altitudes of 44,000 and 25,000 feet. These laboratory experiments were carried to just short of extremis and gave valuable information to help perfect apparatus and technique for baling out in the stratosphere.

In studying the problems of high acceleration in aircraft, that brilliant young American scientist, Commander Eric Lillienkrantz, met his death tragically some two years ago.

In the Royal Air Force, Squadron-Leaders W. K. Stewart and S. Davidson have carried out since 1940 many hundreds of blacking-out experiments in the air, having to bale out from damaged aircraft on more than one occasion. Squadron-Leader Davidson has also for the past year been engaged in experimental flying on jet-propelled aircraft to study various physiological problems. In this connexion, it is of interest to note that some 120 RAF medical officers are qualified pilots, many being highly skilled—flying Spitfires and even jet-propelled aircraft.

Many medical officers have made physiological and psychological observations during actual air operations against the enemy to assess the strain, fatigue, behaviour of aircrew, and general efficiency of the flyer and his equipment. Thus, on a warm summer's day in 1942, that gay lovable Highlander, Group-Captain Hugh Corner, AFC, was shot down in his Spitfire by a Messerschmitt over the English Channel when studying what he called "mental lapses" of members of Paddy Finucane's fighter squadron. Wing-Commander Roland Winfield, DFC, AFC, has done some 50 operational sorties to study aviation medicine problems in Bomber and Coastal aircraft on all fronts. Wing-Commander J. C. Macgown, DFC, earned the coveted Pathfinder badge, studying night vision problems over Berlin and other enemy targets.

To assess the flotation value of life-jackets for the unconscious man, Squadron-Leader E. A. Pask had himself anæsthetised for a total period of 3½ hours, while he was thrown into a swimming-bath in different positions, wearing various types of life-jackets. Many of these jackets were so designed as to ensure drowning of an unconscious man. Of the type he tested, the British Mae West, the New Zealand Navy, and the German life-jackets proved to be the most efficient and to give adequate flotation. A film of these tests was shown to all concerned and most of the defects have now been remedied.

WORKING TOGETHER

In conclusion, I should like to stress that these advances in aviation medicine have only been accomplished by the full cooperation of aircraft instructors, aeronautical engineers, medical men, physicists, physiologists, psychologists, and textile experts of the United States of America, Britain, and the Dominions working in the closest liaison.

Long may this association for our mutual benefit endure in peace as in war. To quote Mr. John Winant, the United States Ambassador to Great Britain, whose words are particularly applicable to aviation: "While we have accepted the machine, we have not always learned to collaborate with one another to make the machine the servant, and not the master of mankind. . . . Never has it been so necessary for man to live and work and cooperate with his fellow-men as it is today."

CLOTHING COLLECTION IN USA.—UNRRA and the voluntary relief agencies in the United States are planning a United Nations Clothing Collection for war-devastated areas. Mr. Henry J. Kaiser will be chairman of the appeal, and the American public will be asked to contribute 150 million pounds weight of clothing.

TREATMENT OF COMPOUND FRACTURES BY EARLY WOUND SUTURE AND PENICILLIN

F. H. BENTLEY * M B, B SC MANC., F R C S LIEUT.-COLONEL RAMC

SCOTT THOMSON M D EDIN., D P H MAJOR RAMC

PENICILLIN CONTROL TEAM, CMF

A. K. BINGHAM M B LPOOL

J. A. KEY M B EDIN.

M. H. WOSTENHOLM M R C S

CAPTAINS RAMC; AT A BRITISH GENERAL HOSPITAL, CMF

AT the beginning of 1944 penicillin was first available to military hospitals in Italy. Encouraged by the experiences of surgeons in North Africa, and under the teaching of Lieut.-Colonel J. S. Jeffrey, at that time Penicillin Officer in Italy, a start was made in this hospital using penicillin in the early repair of flesh-wounds.

Patients were taken to the operating-theatre the day after their arrival at base hospital from the casualty clearing stations, usually about the fourth day. The wounds were cleaned, further excised if necessary before suture, and penicillin was instilled through rubber tubes into the sutured wound twice daily for five days. The results of the first 200 wound sutures done at this hospital have already been reported.[1] They showed primary union in 190 of the 200 consecutive cases. Simultaneously the practice was developing at other centres, until, under the instruction of the Consulting Surgeon, AFHQ, delayed primary suture became the standard treatment of all suturable flesh wounds at base hospital in this theatre of war.

The arguments that commend early repair of a flesh-wound apply with even greater force to the early conversion of an open into a closed fracture. After the first month's experience of the excellent results of early suture, it seemed justifiable to try the same method for wounds complicated by an injury to bone. Accordingly, in February, 1944, we began to treat open fractures by early wound suture and local instillation of penicillin through tubes, in addition to the routine methods of external fixation of the fracture.

The results were as satisfactory as in uncomplicated flesh-wounds, and this report describes the first 62 cases treated. All received penicillin locally into the wound. Later in the series, as more penicillin was available, some cases received a parenteral course as well, though without obvious difference in the result. Of the 62 fractures treated, 58 obtained primary healing of the soft tissues, and 2 healed after removal of a foreign body; these 60 all proceeded to normal bone union. Two were failures.

Methods

Of the 62 cases, 57 were battle injuries due to missiles and had received the routine primary wound-treatment at casualty clearing stations—namely, debridement, decompression, application of bacteriostatic and occlusive dressing. The majority were immobilised with plaster-of-paris. The remaining 5 cases were road accidents, of which 3 had been treated forward in similar fashion to the battle injuries. The other 2 were admitted directly to hospital where it was possible to combine wound excision with immediate repair.

Casualties usually arrived at hospital about the 3rd or 4th day after wounding. Sulphonamides had been given by mouth as a routine, the average dose being 20 grammes. No further sulpha-drugs were given after penicillin treatment was begun. If on arrival the patient was not toxic and the limb was comfortable the wound was not disturbed, and the patient was given 24 hours' rest. During this day the limb was X rayed to define the fracture and the precise position of any foreign body. Next day the wound was examined in the operating-theatre, and sutured if practicable.

The time of wound suture varied from the 3rd to the 20th day, the average being the 6th day. The skin of the limb was cleaned and the wound was then explored with the finger. Any deep track was fully opened up to reveal the extent of the problem and in order that penicillin solution might subsequently reach all parts of the wound.

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* Formerly officer i/c Surgical Division of a British General Hospital, CMF.

1. Bentley, F. H. Report to War Office, May, 1944; *Brit. J. Surg.* 1944, 32, 132.

The possibility of skin suture was demonstrated by pressi[illegible] skin edges were [illegible] superficial woun[illegible] the wound margins were undermined for the minimum distance necessary to ensure approximation. Devitalised and loose tags of muscle were removed, and deep tracks were mopped dry. Loose bone in surrounding muscle was picked out, but fragments in the line of the fractured bone were not disturbed. Comminution of the bone was such that the "fracture-line" was usually an inch or two in length. Early in the series we learned the importance of removing a metallic foreign body lying in relation to the fracture, and thereafter such bodies were always carefully localised before operation and removed. (This subject is referred to more fully below.)

The wound was now ready for suture. Suitable lengths of fine rubber tubing (4 mm. diameter) for subsequent instill[illegible] ("penicillin tubes") were [illegible] cisions made at least 1 inch [illegible] Usually two tubes were introduced, one to either side of the fracture. They led down to the regi[illegible] ing the fracture without [illegible] always a potential cavity [illegible] and one tube at least w[illegible] equally well as a drain t[illegible] be aspirated before each [illegible] ward. This detail is important.

The skin was then closed with interrupted silkworm gut stitches. No deep sutures were used. A considerable degree of tension could be safely allowed, since under treatment with penicillin œdema was quick to subside, but extreme tension was dangerous—as always—and tight skin-flaps stretched over a hollow in the tissues ("tentage") were certain to break down at this point (*vide infra*). Where there was difficulty in closing a wound the answer was either to rotate a flap of skin and fat to complete the suture—a very useful manœuvre—or if the gap was floored by muscle to apply an immediate graft to the open area. This method of obtaining a complete closure was often employed and always successful. We wish to emphasise the importance of obtaining a complete skin closure at the repair operation if subsequent infection is to be avoided.

In cases of fracture of the extremities a dry dressing was secured to the limb and plaster fixation applied in routine manner, the rubber tubes protruding for 3 inches through the plaster. The tubes did not interfere [illegible] fastened down with a light cotton bandage.

Aspiration followed by instillation of solution of sodium penicillin was performed through the tubes morning and evening for the next 5 days. On the 6th day the tubes were freed from the cast and withdrawn, the small holes in the plaster being sealed with a plaster bandage. Usually the cast was not changed for 3 weeks, when the skin sutures were removed and a second plaster was applied.

The technique for fractures of the flat bones, ilium, and scapula was the same, except that no plaster cast was necessary and skin sutures were therefore removed on the 14th day.

Further treatment of the fracture followed routine lines. Exercises were encouraged and the patient was placed under the care of the physiotherapy department from an early stage.

DOSAGE OF PENICILLIN

Five c.cm. of sodium penicillin solution (500 units per c.cm.) was introduced through each tube at the end of the operation, and 3 c.cm. per tube twice daily for a further 5 days. Since most cases had two tubes, this amounted to 6 c.cm. of solution twice daily into the fracture region with a total dose of 35,000 units of penicillin. This proved sufficient to ensure sterilisation of the injured bone and soft parts with consequent primary healing. When parenteral penicillin was given in addition it was continued for 4 days (480,000 units).

TYPES OF WOUND

The 62 fracture cases treated in this way included both penetrating and through-and-through wounds. They varied in length up to 12 inches, but the average was 4 inches, leading [illegible] into comminuted bone. [illegible] as is customary with [illegible] the bone, even if only occupied by bone chips, was surprisingly well preserved.

The bones involved were —

Tibia alone	10	Ilium	8
Fibula alone	7	Scapula	4
Tibia and fibula	5	Tarsus	4
Humerus	9	Patella and femoral condyle	2
Radius and/or ulna	13	Total	62

Major fractures of the femur were not studied, since fractures of this bone were segregated in three orthopædic centres in Italy where they were the subject of a special investigation.

Most of the wounds were clinically clean, but 8 were clinically septic, and of these a wound swab revealed coagulase-positive *Staph. aureus* in 7.

SELECTION OF CASES

The only criterion used in selecting cases for the above method of treatment was that there should be sufficient skin for complete closure, or, if sufficient skin was not available, that the surface of the resulting defect was suitable for skin-grafting. No other factor (such as the age or condition of the wound on arrival, the extent of comminution of bone or muscle laceration) was considered a contra-indication. As a result, the series so treated represented about 70% of all compound fractures admitted to hospital.

Results

Primary healing of the sutured wound and quiescent union of the fracture with no sign of inflammation occurred in 58 cases. No case was observed for less than 5 weeks, when some of the less serious fractures of the ilium, scapula, ulna, and fibula were fit for discharge to unit or convalescent depot. Other fractures were under treatment for a longer period, and all were retained until union was sound.

A feature of these results was the early recovery of function of the injured part as a result of the primary healing and absence of scar tissue, even though there had been much muscle loss. As an example, a wound of the back measuring 8 × 3 in., with extensive muscle laceration leading into a comminuted fracture of the body and spine of the scapula, was healed in 14 days, and the patient was disch[illegible] convalescent depot in 35 [illegible] the shoulder and arm. [illegible] bones had no points of [illegible] interest once healing of the flesh wound was secured, but two types of injury are worth special mention.

The first is the through-and-through wound of the foot with fracture of the tarsus and metatarsus. In the North African campaign we had [illegible] union. We were eager therefore to attempt this present method of treatment, and were satisfied with the results. Primary union occurred in the 3 through-and-through wounds treated, and fusion of the fractured tarsal bones followed to give a painless foot under conditions of moderate strain. It was thought that the medical category of these men would be B 7. The fourth tarsal fracture was an interesting one demonstrating the possibilities of the method employed.

A mortar bomb explosion had split the soft tissues of the heel from malleolus to malleolus exactly like the incision for a Syme's amputation. The injury also split the os calcis in the same line, and the bone had opened out in an inverted V-shaped manner, the apex of the V being at the subastragaloid joint. There was little tissue loss, and it was possible to press the two halves of the bone together and suture the skin of the heel. A fine penicillin tube was in this case into the fracture. Primary union followed, and, after a long period in a series of walking plasters, the man left for the United Kingdom free from plaster or dressing as a walking case. The heel was free from tenderness and should be fit for moderate strain.

We consider that this case would have needed amputation but for the possibility of primary repair that the method offered.

The second important type of injury is the fracture that is compound into a joint, most commonly seen at the elbow and knee. Two case-histories illustrate the results in this type of injury.

Private A.—Bullet wound, fracture of the internal condyle of the humerus and coronoid process of the ulna, with a 6 inch flesh wound (anterior to the ulnar nerve) leading at one point to a ½ inch hole in the capsule of the elbow-joint. After removal of loose pieces of bone, the wound was closed by rotating a flap of skin and fat, and a fine penicillin tube passed down to a point ½ inch away from the rent in the joint capsule, which could not be sutured. Primary union followed and active movement was then encouraged. After 8 weeks there was 80% full range of movement at the elbow-joint, and the man was discharged to a convalescent depot.

Major B.—Mortar wound of the knee. A fragment of bomb had fractured the edge of the patella and passed across the joint deeply into the internal condyle of the femur, where it lodged. The foreign body and a piece of battle-dress were removed from the bone at operation, and a capillary rubber tube was introduced into the walnut-sized cavity that opened through the anterior articular surface of the femoral condyle. It was possible to suture the skin-wound without tension. Only 6000 units of penicillin was run into the bone cavity because it was feared at that time that an excess of fluid might soil the joint. The joint, however, remained quiescent and the wound healed by first intention. After 9 weeks the patient was walking, and the knee-joint was capable of full extension and 30° flexion. He was evacuated to the United Kingdom for prolonged rehabilitation.

Two cases of fracture of the ilium, whose wounds appeared to have united by first intention, broke down after 2–3 weeks. In each the reason for breakdown was a retained metallic foreign body causing a local abscess. In one case penicillin had been given parenterally as well as locally. Removal of the foreign-body and re-suture of the wound combined with the use of penicillin locally were followed by quiescent union of flesh wound and bone. The subject of foreign bodies is referred to below.

L/cpl. C.—Grenade wound of the buttock, with a 5 inch wound through the full thickness of the glutei into a long, comminuted fracture of the ilium. X ray taken at casualty clearing station showed the fracture, but no foreign body was visible. Accordingly routine penicillin suture was performed, followed by a course of parenteral penicillin. Two weeks later the suture line gaped. A wound swab showed *Ps. pyocyanea* only. We were therefore at a loss to understand the breakdown, and the wound was re-explored. A cavity was found in the lateral part of the buttock connecting with the main wound and containing a small quantity of pus (*Ps. pyocyanea* only) and a lump of metal 1 in. × ¾ in., which lay outside the field of the previous X ray. The metal was removed and the wound resutured, again using penicillin tubes. Primary healing followed this second operation and the patient was discharged to convalescent depot at the tenth week.

Private D.—High explosive wound of the hip, with a 6 inch flesh defect above the great trochanter leading into a comminuted fracture of the ilium. There was a hole 1 inch in diameter in the fractured bone. X ray showed that the foreign body had passed across the pelvis and lay adjacent to the tip of the transverse process of the 4th lumbar vertebra. The foreign body was considered to be too far from the fracture to require removal, and the wound was sutured in routine manner, one of the penicillin tubes passing down to the hole in the ilium. Three weeks later the central inch of the suture line broke down and a sinus formed. Swab showed *Staph. aureus* (penicillin-sensitive). Because of the difficulty of an exact localisation of the foreign body and the problem of surgical approach, its removal was deferred, and it was hoped that the sinus would close spontaneously. This did no[illegible], and after 102 days an extraperitoneal approach [illegible]e from the right iliac fossa and a ½ inch piece of [illegible]d and removed from the psoas muscle at the side of the body of L IV. No track was discovered between this site and the ilium, but suture of the orifice of the sinus and introduction of a penicillin tube through a stab incision down to the region of the hole in the ilium was followed by union. The man was discharged to convalescent depot 31 days later, having no obvious disability.

Two cases were failures—one a fracture of humerus with large tissue loss posteriorly, the other a fracture of the lower end of the tibia with a cavity in the bone produced by a large piece of metal. The latter case had parenteral as well as local therapy. In each instance the skin was sutured under tension over a hollow in the bone. It was impossible to rotate a flap and free grafting was impracticable. Breakdown occurred in both during the first week, swabs from the wounds showing *Ps. pyocyanea* only. These examples reinforce a lesson we have learned from flesh wound suture, that "tentage" spells failure.

In about half the total cases parenteral penicillin (4 days, 480,000 units) was given in addition to the routine local therapy. No difference was observed between the results of those having local instillation and those having a parenteral course as well. Both were equally satisfactory.

The disposal of the cases is shown in the table. Of the 62 cases of compound fracture treated by this method, 48 returned to duty. It is not unfair to assume that few of these would have remained on active service abroad if they had been treated by other methods. Twelve men went home, 8 for lengthy rehabilitation, and 4 because of multiple injuries. There were 2 failures resulting from undue tension in the suture-line, as described above.

DISPOSAL OF CASES

Site of fracture	Returned to duty	To UK for long rehabilitation	To UK for other injuries	Failures	Total
Tibia alone	8	1	0	1	10
Fibula alone . .	6	0	1	0	7
Tibia and fibula	2	3	0	0	5
Humerus . .	7	1	0	1	9
Radius and/or ulna . .	11	0	2	0	13
Ilium . .	7	0	1	0	8
Scapula . .	4	0	0	0	4
Tarsus . .	3	1	0	0	4
Patella and femoral condyle . .	0	2	0	0	2
Total . .	48	8	4	2	62

Discussion

The methods have been described in some detail because the results show that the presence of a bony injury need not complicate the practice of repair, and that uniformly good results may be looked for if the wound over the fracture can be closed. From our investigations we are convinced of the importance of removing a foreign body in relation to the fracture, of the necessity for complete skin closure, and of the value of local application of penicillin to the fracture region.

PRESENCE OF A FOREIGN BODY

In the suture of uncomplicated flesh wounds the presence of a buried metallic foreign body had not been found to be a source of trouble, so, unless it was large, a search was not made for any missile not readily found by the exploring finger. Early in this series of compound fractures, however, the importance of removing a foreign body was brought unpleasantly to our notice in the 2 cases of fracture of the ilium referred to above (L/cpl C and Private D).

After this early experience we invariably localised foreign bodies precisely by X ray and removed them, either at the first operation or by a separate approach after a week or so if removal through the wound of injury was impossible. Two cases in which the latter method was necessary were instructive in demonstrating the [illegible] and the neces- danger of a metallic foreign [illegible] sity for its removal. One [illegible] and the other a fracture [illegible] in both were the same. The [illegible] had passed for 2 inches along the tinating the cortex, had passed for 2 inches along the [illegible] One to two weeks after the suture [illegible] exposed through a [illegible] r-hole in the cortex [illegible] It was found to be [illegible] and except at a few points was out of contact with the surrounding tissue through which it might otherwise have been sterilised by parenteral penicillin. Thus, in addition to the [illegible] chemical reaction, it con- liability [illegible] source of stituted [illegible] series, is infection. [illegible] quoted—

Private E.—Grenade wound of the ankle with foreign body lying in the centre of the astragalus. Skin suture was impossible. An occlusive dressing was applied and a five-day course of parenteral penicillin given. Two days later the wound was exposed and the foreign body removed. A swab was inserted into the cavity in which the metal had lain, and was reported "*Staph. aureus*+++, penicillin-sensitive."

In each of the two cases of fracture of humerus and tibia described above, a penicillin tube was inserted into the cavity in the medulla after removal of the foreign body and the skin incision was sutured. Normal healing followed and both men were later discharged to convalescent depot.

COMPLETE SKIN CLOSURE

The necessity for complete skin closure is twofold. It prevents further infection reaching the bone and reduces scar-tissue formation to a minimum throughout the whole wound, since deep [illegible] heal more rapidly and smoothly under intact skin. [illegible] of prime importance in wound [illegible] more than the prevention of infection.

Prevention of infection is nevertheless essential in the successful treatment of an open fracture, and it is our opinion that partial suture of a wound does not ensure that the fracture will become sealed off and safe from reinfection. The advisability of a period of drainage of a fracture by leaving the wound partly open is being debated at present. It appears to us that, if the hæmatoma region of the fracture is sterilised by instillation of penicillin locally, and pooling of blood or serum is prevented in this region during the first few days after repair by means of a penicillin tube, the problem of "drainage" is solved. The track of a penicillin tube—introduced through a stab incision—is closed in 48 hours after removal of the tube, and if the wound of injury is sutured there is no possibility of reinfection; our results support this latter contention.

Furthermore, information is available to show that reinfection of an incompletely sutured fracture wound does occur.[7] Fraser and his colleagues investigated the use of penicillin in the closure of open fractures admitted to a hospital in Sicily from the Salerno beaches. In 21 cases the wound over the fracture was only partly sutured, the wound was dusted with penicillin powder and dressed with soft paraffin gauze under a closed plaster cast. About half of the cases received a short (3–4 days) [illegible] swab was [illegible], and again [illegible] Eighteen of the 21 cases showed no pyogenic cocci at the suture operation, but only 7 of these were still uninfected at the change of plaster, 11 yielding growths of pathogenic bacteria. Thus out of 18 uninfected incompletely sutured compound fractures 11 subsequently developed pyogenic organisms in the wound.

Furlong and Clark,[7] in a series of compound fractures of the femur treated by partial suture and [illegible] penicillin 910,000 units over [illegible] ses where wound [illegible] only coliform bacilli, swab at the time of suture revealed only coliform bacilli, 9 showed pyogenic cocci at the first change of dressing 3–4 weeks afterwards.

The precise significance of pathogenic cocci in the [illegible] wound over a fracture has not been fully [illegible] ly sealed off they may [illegible] is a common experience that in some cases in which a granulating wound over a fracture has been slow to heal a sinus into infected bone has later declared itself. There is no certainty of the final result in the description that is sometimes given of "wound granulating but fracture sealed off."

LOCAL OR PARENTERAL PENICILLIN?

Inspection of a gunshot wound causing a compound fracture usually reveals an extensive area of comminuted [illegible] bruising of the bone and co [illegible] the bone for a surrounding [illegible] exists around short distance [illegible] damaged bone the fracture [illegible] blood, and is and muscle [illegible] referred to by us as the "hæmatoma region." Only the clot lying in the wound cavity, and the larger loose pieces of bone in surrounding muscle can be removed at operation. There remain numerous more or less avascular bone particles in the fracture, and much extravasated blood an [illegible] th [illegible] da [illegible] ad [illegible] m [illegible] hæmatoma region during the first week or so after injury, and this is borne out in practice. For example we may quote 2 cases of through-and-through gunshot wounds of the thigh with compound fracture of the femur and small clean flesh wounds. In one, the wounds were completely sewn up on the 5th day, and 600,000 units of penicillin given parenterally over 5 days. In the other, repair was done on the 10th day, and penicillin given for a week with a total of 840,000 units. In both the wounds united, but from the 15th to 21st day deep inflammation was evident, and pus discharged through the suture-line. [illegible] penicillin-sensitive. [illegible] later. In anoth[illegible] fractured tibia, [illegible] the 5th day, and 480,000 units of penicillin given parenterally over 4 days. A week later the wound became inflamed and pus containing *Staph. aureus* was discharged. The organism was found to be penicillin-sensitive.

Similar observations have been reported by Furlong and Clark in their War Office report of May, 1944. Bacteriological data are provided by Fraser and others who were able to examine fracture wounds in the middle [illegible] cillin. They describe [illegible] administration (360,000 [illegible] region revealed *Staph* [illegible] of trying to solve this problem. One is to continue the parenteral administration [illegible] the [illegible] mer [illegible] dow [illegible] str [illegible] the [illegible] concentration in and around the damaged tissues, until by the end of 5 days [illegible]

We have no [illegible] is attempted, it [illegible] of pus in the pot[illegible] for it is recogni[illegible] collection of pus may form in this situation, particularly in the case of a gross fracture surrounded by bulky muscle. Our experience with flesh wounds shows that a pool of pus, even if sterile or infected by non-pathogenic organisms, invariably bursts through the suture line. It is one of th advantages of the local instillation method that although it adds fluid to the hæmatoma region, injection can be preceded by aspiration, and if the tubes are correctly sited no pool will occur.

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[7] Fraser, I., Pedlick, W., Thomson, R. Report to War Office, November, 1943. Furlong, R., Clark, J. M. P. Report to War Office, May, 1944; Brit. J. Surg. 1944, 32, 117.

The instillation of solutions of penicillin to effect sterilisation and primary union of a compound fracture wound was the logical outcome of the success of this method in suture of flesh wounds. We have found it entirely satisfactory when combined with the surgical technique described in this report. There may be occasions when it is doubtful whether the penicillin solution can reach all parts of the wound, and when the addition of parenteral treatment will constitute an additional safeguard. But among many cases of penetrating lacerated muscle wounds of the thigh we have had no instance in which local penicillin therapy failed to sterilise any pyogenic infection present; and in this series of compound fractures local penicillin therapy alone was found to be in no way inferior to local plus parenteral treatment.

Pus due to coliform bacilli ("gram-negative pus"), which is a feature of local penicillin-solution technique, was not found a source of trouble, providing it was not allowed to collect and constitute a mechanical problem. Neither in these fractures nor in 500 flesh wounds sutured similarly have we seen an instance of sepsis of bone or soft tissue due to *Ps. pyocyanea*.

There is a further problem to discuss—the use of local and parenteral penicillin in combating infection due to a *Staph. aureus* that is insensitive to penicillin by the ordinary tests. A survey of battle wounds showed the organism of initial sepsis to be almost always the *Staph. aureus*, and in an investigation of many hundreds of wounds at forward base hospitals we have found that 20–50% (depending on therapy at casualty clearing station) harboured this organism on admission to hospital; 17% of the staphylococci were resistant to concentrations of penicillin obtained in the blood or tissue fluid by parenteral therapy alone. This constitutes an appreciable hazard in the closure of an open fracture.

The percentage of staphylococci resistant to penicillin is less, however, when the concentration of penicillin is increased above that obtained in the blood. In a study of strains of *Staph. aureus* designated "resistant," all grew freely in broth containing 1/10 unit of penicillin per c.cm., corresponding to the usual blood concentration. Approximately half grew when the penicillin was increased to 10 units per c.cm., and only a few grew in a concentration of 50 units per c.cm.

It is reasonable to think that the instillation at 12-hourly intervals of solutions of penicillin containing 500 units per c.cm. will maintain a higher local concentration of penicillin than that produced by parenteral therapy, and therefore will be more effective in dealing with staphylococci that possess some degree of resistance.

Summary

Wound suture at an early stage combined with penicillin therapy was performed in 62 cases of war wounds associated with fractures. There were 58 immediate successes, with primary union of flesh wound and bone, and 2 in which success followed operation for removal of a foreign body. Two were failures.

All cases received penicillin locally, but only half received a course of parenteral therapy in addition. The same degree of success was obtained in both.

The importance of removing a foreign body and the necessity for complete skin closure are stressed.

Parenteral penicillin cannot sterilise avascular bone fragments and extravasated blood around the fracture during the first few days, whereas the local instillation of penicillin in sufficient strength and volume can do so. When combined with the surgical technique described, local penicillin instillation has proved entirely successful in sterilising and effecting primary union of compound fracture wounds.

We wish to thank Colonel C. H. K. Smith, Officer Commanding the British General Hospital, for the help that made this investigation possible, and for permission to quote from the hospital records; Major F. Pygott for his careful radiological localisation of foreign bodies; and Miss T. F. Rickards, Physiotherapy Service, under whose direction rehabilitation of the injured men was conducted.

COMPOUND FRACTURES OF THE FEMUR

TREATED WITH THE AID OF PENICILLIN

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THE use of penicillin has encouraged the employment of methods in the treatment of fractures of the femur which, although considered desirable, have not been generally regarded as safe.

When a debridement has been done some days previously, the use of penicillin makes it possible to sew up infected and purulent wounds and to encourage active movement, not only without danger to the patient but with positive benefit to the limb. On early closure and early movement depends the fullest possible restoration of function, for early closure limits the extent of the scar and diminishes the chance of bone sepsis; and early movement of the knee is even more desirable in preventing adhesions in compound fractures than it is in closed fractures.

These methods were occasionally used before penicillin but now they can be used with greater success and safety. Formerly it was the danger of spreading sepsis that was feared, but now, with penicillin, we have the assurance that as soon as streptococci, staphylococci, and anaerobic bacilli enter the blood- or lymph-stream they are destroyed.

A possible reason for the lack of enthusiasm shown by some surgeons for the use of penicillin in fractures of the femur may be that with the exception of the injections they have treated their cases in the conventional manner. The skin has not been sutured as early as possible, nor have early movements been encouraged. Certainly penicillin does not have so dramatic an effect on local sepsis as it does on the prevention of its spread, but that prevention is absolute. For instance, there were no deaths, no amputations, and no septicæmia in our series; and it is noteworthy that Furlong and Clark (1944), who seem, on the whole, not to have been very favourably impressed by the effect of penicillin on these cases, also had no deaths from sepsis and no amputations for sepsis in their series of 70 compound fractures treated with penicillin; whereas in the 70 controls there were 3 deaths and 4 amputations due to sepsis.

The *Medical History of the War* (1922) quotes a memorandum by Sir Anthony Bowlby in which he estimated that at the end of the last war the overall mortality for fractures of the femur, excluding cases with associated injuries, was about 15%. Most of the deaths were due either to pyogenic infection or gas-gangrene. The *History* also shows that the value of early suture and early movement became appreciated towards the end of the war. Thus in No. 8 General Hospital in France, of 211 femur wounds treated by delayed primary suture, 161 were successful. Bowlby observed: "the results of treatment of open fractures of the femur have very greatly improved in proportion as the practice of delayed primary suture has increased. Closure diminishes risk of all kinds of complications and gives rise to much more rapid union." Further, Pearson and Drummond (1919) were impressed with the importance of obtaining knee movements from the start and for this purpose used Besley's callipers. In those days, even with the grave danger from spreading sepsis, it was thought desirable to close wounds early and start early movement. How much more desirable is it to follow these principles now, when the danger to life and limb is removed and we are free to concern ourselves with attempting to restore a complete and early return of function.

EXPERIENCE SINCE D-DAY

We have treated 70 cases of fractures of the femur since D-day, June 6, 1944. The great majority of patients reached us between the third and tenth days after wounding. All came in Tobruk plasters, having had debridement of the wound, the wound being left open. Many had associated injuries, but all had travelled well and were not obviously imperilled by the journey. The primary treatment they had received was of a very high standard.

Nearly all the patien [illegible] arrival, but the doses ir [illegible] both as to dosage and [illegible] they had had four or five days' continuous treatment with two to five injections a day, the dose being usually 20,000 units and sometimes 50,000 units. There may have been a gap of some days when penicillin was not given, but on arrival here they were immediately started on a five-day course of 20,000 units intramuscularly every three hours.

Many patients arrived with a temperature of about 100° F and pulse-rate of 100–110 [illegible] ture in most of them subsided a [illegible] times the penicillin was omitte[illegible] had settled. The temperature was not thought to be a reliable guide, for penicillin is sometimes in itself the cause of pyrexia. Better evidence of the patient's progress could be obtained from inspection of their local and general condition, and, if they have been ill for a week or so, by an estimation of the hæmoglobin.

After 24 hours' rest, the plasters were removed under anæsthesia and the wounds were inspected. Nearly all had a sulphonamide 'Vaseline' gauze pack. Pus in varying degrees was present in most of the wounds. In some the pack had, by swelling of the soft tissues from œdema, become a plug or bung and was damming up the pus. A few had sloughs, but when these were removed, and when the pus was cleared up, the wound looked clean.

After the first few cases, we became convinced that complete closure of the skin gave by far the best chance of early healing and avoidance of bone infection, and wherever possible the wound was thereafter sewn up completely, regardless of the amount of infection present. Even if the wound could not be completely closed at the first inspection, owing to œdema, as much as possible was sutured, and it was nearly always found that an incised wound without gross skin loss could be completely closed five days later.

The suturing was not determined by bacteriological findings but on anatomical grounds alone. It was felt that only streptococci and staphylococci would be likely to enter the blood and they would there be destroyed through the action of the penicillin. We have found that [illegible] to g[illegible] prob[illegible] largely act as saprophytes. If the wound is sutured they have no [illegible]

A swab was [illegible] Only in 2 wo[illegible] and *Staph. aureus* found on culture. Many, however, had coliform bacilli and some had *B. proteus*. A few had gas organisms and one had *Ps. pyocyanea*. The streptococci and staphylococci had been killed by the penicillin, and any pus was due to gram-negative organisms and was only mildly noxious.

DRAINAGE

Drainage is not desirable in these cases. It is probably better to include gram-negative organisms than, by leaving the wound open, to allow access to streptococci and staphylococci, which will grow after cessation of the penicillin, particularly if a thick layer of granulation tissue has formed a barrier to systemic penicillin. It is more important to prevent microbes getting in than to give a permanent exit for this kind of pus. With any sort of drainage there is the possibility of two-way traffic. Even penicillin tubes seem to do more harm than good. A sinus often followed, though as a rule this healed in a week or two. There is reason to suppose that it would not have occurred if the tube had not been inserted. In 2 instances in which a penicillin tube was inserted gram-positive cocci reappeared after the removal of the tube.

With drainage or without it there was no instance of spreading sepsis. It has not been necessary to open an abscess in any other part of the thigh than the original wound: in fact, only in 2 completely sutured cases was it necessary to reopen the wound. There has been no cellulitis, lymphangitis, or septicæmia.

Sumping, or the loculation of pus, has not occurred in any case completely sutured. In 6 unsutured wounds on the anterior aspect of the thigh, with the opening pointing upwards, there was a tendency for sumping to occur. In one case only was it accompanied by constitutional symptoms.

Suture, or even partial suture, by obliterating the dead space prevents a sump, and, even when the wound is not sutured, movements of the knee produce a pumping action of the quadriceps, thereby limiting the size of the sump by emptying it every time the muscle contracts. In no instance was a posterior counter-incision necessary; nor was it necessary to obtain dependent drainage by applying a spica and turning the patient on his face.

RESULTS OF SUTURE

Of 48 cases completely sutured, 40 healed in a month; 4 more healed at three months; 4 failed and had a sinus at three months. Of 17 which could be only partially closed, 11 were healed and 6 had a sinus at three months. Of 5 cases which had to be left completely unsutured 2 were healed and 3 had a sinus at three months. Thus only 4 of the 48 completely sutured had a sinus at three months against 9 of the 22 incompletely closed. The extent of the bone damage was comparable in each group.

The success which accompanies suture of the wound on the third day prompts one to think that it might with advantage be sewn up on the first day at the time of debridement, provided that continuous observation is possible. From our experience it seems as if, with penicillin, drainage after that period is unnecessary.

CHRONIC BONE SEPSIS

In 13 cases a sinus leading down to the bone was present at three months. Of these, 5 had a low-grade osteitis of cancellous bone at the upper or lower end. Four have had sequestra removed and there is a possibility of this [illegible] er 3. One has a frank osteo[illegible] large buttock wound which it [illegible]

UNION OF BONE

Union of these compound fractures proceeds as quickly or even more quickly than in closed fractures. The factors which lead to this surprising result are difficult to determine. The fragmentation that accompanies a gunshot wound may contribute to a more copious production of callus. It may be that the hyperæmia caused by the controlled infection plays its part. If the sepsis were not controlled by the penicillin it might become a danger to union, but a slight amount of infection may help union by inducing a useful hyperæmia. Even when chronic sepsis of the bone develops, as evidenced by a persistent sinus, union was not delayed, nor was walking deferred.

It is extremely undesirable, and also quite unnecessary, to remove bone fragments unless, as occasionally happens, they are widely displaced. Even if stripped of periosteum the fragments become revascularised and incorporated in the bone. It is remarkable how a mixture of small bone fragments and pieces of metal grows together to form a new shaft.

To secure union in a grossly comminuted fracture it is unnecessary to allow the bone to shorten by telescoping [illegible] ay be safely [illegible] cases treated [illegible] with the exception of one case in which bone fragments were inadvisably removed.

Where, owing to bone loss, a mere bridge of bone remains joining the two main fragments, union proceeds at a normal rate, but there will be no tendency for this bridge to thicken, possibly because it becomes closely invested by a new periosteum. Before weight-bearing is allowed it may then be necessary to thicken the bridge by a graft.

In compound fractures, as in closed, the most potent cause of delay is overpulling. Non-apposition of the bone fragments, so long as they are not overpulled, does not appear to delay union. Lateral gaps of [illegible] inch are satisfactorily bridged, but with some delay in weight-bearing.

In 62 cases the average time of union, judged from the time of discarding all splintage, was thirteen weeks. Weight-bearing was allowed about two weeks later. In 5 cases a graft to reinforce a slender bridge of bone will be necessary. Two cases will not unite owing to loss of the head and neck. One has simple non-union requiring plating after the bone ends have been freshened.

RESTORATION OF FUNCTION

Until penicillin became available most of our compound fractures of the femur were left unsutured and treated in spicas. Most had stiffness as a result, and it was not uncommon to see an immobile lifeless limb sodden with pus. Since then they have been treated with skeletal traction with a pin through the tibia, and early movement of the knee. We took this somewhat unorthodox step with diffidence, fearing that the effects of sepsis might be increased and that union and the healing of soft parts might be delayed thereby. None of these fears however proved justified. Early movement of the knee brings about the early disappearance of œdema and greatly reduces adhesions between tissue planes and muscle, and bone. The danger of intra-articular adhesions is also lessened. Not only is the extent of the scar greatly limited by early suture, but it is prevented from contracting by movement of the knee; mere static contractions of the quadriceps are less effective in this respect.

Early movements of the knee are accompanied by movement at the fracture site in the early weeks. This has been accepted. But it has proved no disadvantage, since it has caused no loss of apposition and no delay in union.

In 12 cases early movement was not possible because either extensive bone loss or a large buttock wound made a spica necessary, or, in 3 instances, owing to irreparable damage to the quadriceps tendon and the knee. All but 1 of these 12 cases had a greatly restricted range at twenty weeks.

The great majority (58), however, were treated with early knee movement. At four months, 3 of them had full range, 23 had 90° or more, 21 had 45°–90°; it is expected that all of these 47 will have a full range at nine months. Nine cases had a range of 30°–45° at four months, and a proportion of these will have a full range at nine months. In 2 only was the knee written off.

If a forecast may be permitted we expect that 40–50 of these patients will have a normally functioning limb within nine months.[1]

SUMMARY

In the treatment of 70 cases of compound fractures of the femur due to wounds sustained in operations in North-West Europe penicillin has abundantly justified itself as a defensive weapon. To exploit its value to the full it should be used as a weapon of attack; for with it two extremely desirable principles can be followed—early closure of the wound and early movement of the knee.

There were no deaths, no amputations, and no evidence of spreading sepsis. In the 48 cases that were completely closed restoration of function as well as the rate of union were equal to that in closed fractures. It is expected that from 40 to 50 will eventually have no disability from their fractured femur.

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[1] In oblique fractures we have had 3 instances of the spike of the upper fragment piercing the quadriceps. Before an appreciable range of movement could be obtained at the knee the spike had to be removed. This was not done until the fracture had united at its upper part.

THE REGIMENTAL MEDICAL OFFICER.—At a recent conference in Bengal attended by 158 doctors from the British and American armies, the Royal Navy, and the RAF, emphasis was laid on the responsibility borne by the regimental medical officer. Like the general practitioner at home, he was the backbone of the medical services, and only too often he had little reward. His work was at times monotonous, at times arduous, and often taken for granted; he lacked the stimulus of close contact with his colleagues and with hospital researches, and his patients were lost to him as soon as they were evacuated. The conference accepted the principle of "Best Men Forward." The RMO, working alone and under conditions of discomfort and often danger, should be regarded as the embodiment of the RAMC motto

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ARTIFICIAL RESPIRATION BY RIB TRACTION

R. VISWANATHAN, MD LOND., MRCP, TDD
LIEUT.-COLONEL IAMC

THE main time-honoured methods of artificial respiration, *Schäfer's and Silvester's, depend for their efficacy on the elastic recoil of the chest wall and diaphragm*, which occurs only when the muscles of respiration have maintained their tone and integrity. The weak points in Schäfer's method have been described by Eve (1943). In the deeply unconscious patient, whether his state is due to drowning, electrocution, or general anæsthesia, the elastic tone of the respiratory muscles fails progressively. Barclay has shown by radiography that in the prone position the diaphragm is pushed up into the full expiratory position. This will be accentuated in a toneless body. Silvester's method will also fail in the moribund person, in whom the intercostal muscles have lost their tone. Both the methods break down because they are directed towards helping expiration rather than inspiration. When the tone of the respiratory muscles is partially or completely lost, the thorax must be in the position of expiration. Hence a simple method which actively brings the chest into the position of inspiration should be effective. One should aim at expanding the chest rather than squeezing the already contracted lung.

THE METHOD

Experimenting on warm cadavers and on patients under deep general anæsthesia, I found that by pulling *on the lower costal margins in an upward and outward* direction with hooked fingers of both hands the chest can be made to assume the raised position of inspiration. Relea [illegible] with gentle pressure on the lower [illegible] hands, is quite sufficient to bring about expiration.

If the patient is on a bed or on an operating-table lying on his back, the operator stands at the head end and places the palms of the hands on the lower part of the chest, the middle fingers being on the anterior axillary lines. The fingers are hooked round the lower costal margins on both sides. The pull is made in an upward and outward direction, thereby raising the anterior portions of the ribs as well as widening the lower costal arches. After a steady pull for 3 seconds the pull is released and the chest is gently pressed downward and inward, while the extended fingers exercise the same pressure on the abdomen. Doing this about 12–15 times a minute brings about a respiratory exchange of over 7000 c.cm. of air. In addition, the expansion of the chest and outward stretching of the diaphragm, owing to the widening of the lower costal arches, helps the venous return of the blood.

If the patient is in the face-down position, the operator stands as before, but his hands are brought underneath the chest and the lower costal arches are pulled upwards and outwards.

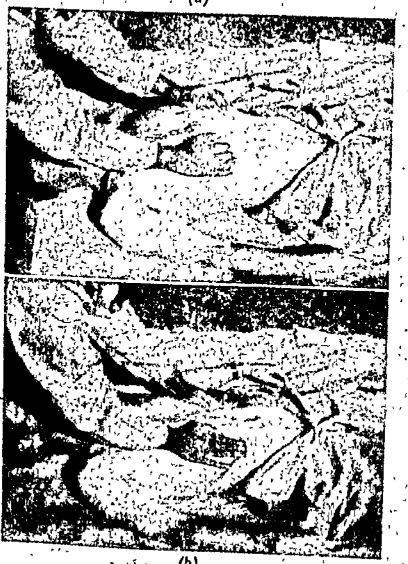
I had the opportunity to give an extensive trial to this method in the following case of cerebral hæmorrhage.

The patient was deeply comatose and had Cheyne-Stok breathing. His pulse was slow. In half an hour his breat ing *stopped, and his pulse could not be felt. I tried* th above method of artificial respiration, never hoping bring back the pulse, but to my surprise the pulse at th wrist returned after three or four attempts. Respiratio was not restored so artificial respiration was continue For purposes of comparison one of the surgeons tried th Silvester method, but found it much less effective becau the respiratory muscles were toneless. The patient w kept alive for 6 hours, including a period of operation lastin for over an hour, by this method of artificial respiratio alone; after that he was put in a mechanical respirato I observed that whenever artificial respiration was stoppe for a few seconds his pulse began to fail, showing that th method helps to restore the circulation as well. The su geons and the anæsthetists of the hospital were satisfie with the efficacy of the method.

EFFICIENCY OF THE METHOD

Cordier (1943) *lays down three requirements for judg*ing the efficiency of any method of artificial respiration

It must give sufficien
normal subject at rest ;



Method in use : (a) inspiratory position ; (b) expiratory position.

were relaxed and the man had almost stopped breathing. The air expelled by pressure on the lower ribs after the inspiratory pull on the costal margins was collected in the rebreathing bag of a Boyle's apparatus and measured. This was compared with the amounts collected by Schäfer's and Silvester's methods. The average results were as follows.

Schäfer's method	278 c.cm.
Silvester's method	425 „
New method	836 „

The considerable difference in ventilation is evidently due to the fact that the new method assists both the inspiratory and the expiratory processes.

I believe the method also satisfies Cordier's second requirement. In the case reported above the pulse returned to the wrist after three or four attempts at artificial respiration. During the process the tips of the hooked fingers of the left hand of the operator press on the left side of the diaphragm, and so probably stimulate the heart mechanically. The venous return to the heart is aided by increased negative pressure produced inside the chest during inspiration.

The method is harmless and easy to execute, and is particularly convenient when respiration becomes suspended during anæsthesia, since it causes little disturbance to the patient.

SUMMARY

A new method of artificial respiration is described in which inspiration is encouraged by intermittent traction, upwards and outwards, on the costal margin.

The method also helps the venous return, and puts less strain than other methods on the operator.

My thanks are due to the surgeons and anæsthetists of the General Hospital for allowing me to give an extensive

Continued at foot of next column

HIGH BLOOD-PRESSURE AFTER BATTLE

JAS. D. P. GRAHAM, M D GLASG.
CAPTAIN RAMC

IN 1920 Alvarez, in an examination of the blood-pressure of 2030 healthy male students, found that the mean systolic pressure for men of 16–40 years was 126·5 mm. Hg, ranging from 90 to 175 mm., with half the sample giving figures between 116 and 136 mm. Hg. He pointed out that 50 out of 100 men (in America in 1920) died of some cardiovascular or closely related disease, and suggested that a systolic blood-pressure of 140 mm. Hg in a young

tensive diathesis.”

Air Force pilots ex.

had blood-pressures

mm. Hg ; the effect of hot climates was to reduce slightly the average pressure (average pressure of pilots at home 125/77, abroad 122/76 mm. Hg), but 308 pilots in Egypt had the same blood-pressure as the home average. According to Gilchrist (1940) hypertension may be described as balanced if the systolic pressure is equal to the diastolic

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Bramwell (1940) considers that any systolic pressure up to 150 mm. Hg is acceptable as normal. Sorapure (1918) analysed the findings in 769 soldiers in training, and gave figures with a range of 105–135 mm. systolic and 70–90 mm. diastolic pressure. In 1000 healthy civilians of 15–40 years Woley (1910) found an average systolic pressure of 125 mm. Hg ; Symonds (1923) found an average systolic pressure of 124 mm. Hg in 100,000 people aged 20–40 years of normal build, and an average diastolic pressure in 60,000 people of 80–83 mm. Hg ; he thought that pressures of 155/94 mm. Hg and over indicated danger. Fisher (1914), from an analysis of 4000 people aged 20–40 years, gave the average systolic pressure as 124·5 mm. Hg, while Smith (1918) examined 400 recumbent fit men, age 19–39 years, and obtained average figures of 127/84 mm. Hg, with a range of 119–132 systolic and 80–88 diastolic.

It seems clear, then, that a fit man of normal build within the age-limits of 18–40 years should have a blood-pressure not exceeding 155/95 mm. Hg, and that most samples examined will give a mean reading of about 125/82 mm. Hg. Any diastolic pressure of 100 mm. Hg or over may safely be termed hypertensive.

PRESENT INVESTIGATION

The object of the investigation now reported was to ascertain if a minimum period of one year of active warfare had any deleterious effect on the physical well-being of the troops engaged.

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blood-pressure was taken with a good mercury manometer in the supine position after 5–8 minutes' rest in the shade, the lowest of three readings being recorded. Day temperatures were about 80–85° F in the shade and the subject was exposed to a draught while resting. The level of diastolic blood-pressure was that recommended by the British opinion of the Anglo-

Continued from previous column

trial to this new method on their cases. I am indebted to the O/C an I.G.H. for allowing me to experiment on an anæsthetised patient, and to Captain Forrest and Captain Boro for their assistance.

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US committee on the measurement of arterial blood-pressure (*Brit. med. J.* 1939, ii, 184). All subjects were fit for duty, medical category A, and had not "been sick" for four weeks. Officers, NCOs, and men were tested impartially; all were familiar with the examiner and were reassured before examination. In general their attitude was one of mild interest; no-one appeared to be excited. The men were used to routine medical inspections, were long familiar with their doctor, and had neither hopes nor fears about the outcome of the test.

The survey began on May 28 and finished on June 28, 1943. It was made on 695 men between the ages of 20 and 38 years, of average height and body-weight, and was conducted at a training area in Tripolitania 4–8 weeks after battle had ceased. All the men had served for a year in active field operations, the vast majority for 2–3 years; many had been in the Middle East for continuous periods up to 5 years. Local conditions at the time of testing were good, with sea-bathing and organised sports and entertainment. Training programmes were light and no exercise was taken within an hour of examination. Diet had been supplemented with bread, a little beer, and some vegetables.

RESULTS

The blood-pressure readings in the 695 men were as follows—

Mean blood-pressure of total sample, 154/90 mm. Hg $\pm\frac{0{\cdot}867}{2{\cdot}206}$ (SE)

Number of hypertensive cases (diastolic 100 mm. Hg), 187.

Mean blood-pressure of hypertensive group, 178/114 mm. Hg $\pm 1{\cdot}729/0{\cdot}916$.

Mean blood-pressure of normal residue, 146/81 mm. Hg $\pm 1{\cdot}382/1{\cdot}212$.

Of the whole group, 26·9% had a diastolic pressure of 100 mm. Hg or over, and 38% had a systolic pressure of 160 mm. Hg or over. The mean pressure of these cases was of the balanced type of hypertension, suggesting that the observed results were *not* due to immediate excitement.

The resting pulse-rates ranged from 50 to 116 per minute, with a mean figure of $74 \pm 3{\cdot}2$. Well-marked sinus arrhythmia was noted in 5·1% of the whole group.

Of the 187 hypertensive cases, the urine was tested in 125; 3 cases had albuminuria and were sent to hospital. Only 21 of the 187 cases complained of any symptoms, which took the form of headaches, palpitation, and dizzy spells or "black-outs" on bending down or on first rising in the morning. It was possible to re-examine 33 of the cases with a diastolic pressure of 100 mm. Hg or over after two months during which local conditions remained the same but the prospect of further battle had temporarily receded. It was found that 28 cases had partially returned to normal so as to have a mean blood-pressure of 157·7/92·1 mm. Hg.

The majority of the hæmoglobin figures were normal; 27 out of 245 measured had a reading of 90% or less on the Sahli scale, while 60 men (24·5%) gave a reading of 110% or over, the maximum being 130%. Of these 60, 13 had a diastolic pressure of 100 mm. Hg or over, and a resting pulse-rate of over 100 per minute. There did not appear to be any constant relationship between high hæmoglobin readings and hypertension.

DISCUSSION

The hypertension among this sample of troops resting after battle may have been of renal or of neurogenic origin, dependent on (*a*) long subsistence on battle rations; (*b*) "desert life" (i.e., dust, movement, dehydration, lack of proper rest, frequent physical strain); (*c*) "battle strain" (i.e., a degree of anxiety neurosis or the result of frequent maximum physical effort with an attendant anxiety factor).

The food factor is unlikely to have been important, for the rations were well balanced and did not differ substantially before and after the test was carried out except perhaps in palatability. There was little concrete evidence of kidney damage among the hypertensive cases, but as Goldblatt and others (1934) have shown it is possible to produce a persistent high blood-pressure of renal origin although there is no evidence of [illegible]bility in the urine. Dehydration was a persistent feature of campaigning life in the desert, with a high incidence of hæmorrhoids, varices, and calculi. Treadgold (1935) found no difference between the blood-pressure of fit men in the United Kingdom and in Egypt, but his subjects would not be suffering from physical or mental strain or dehydration. His psychoneurotic cases had normal blood-pressure, so a mild degree of anxiety neurosis would seem unlikely to affect the pressure.

For days on end men taking part in a big battle show evidence of hyperadrenalinæmia, with a fast pulse, pale face, and enlarged pupils, even when there is no immediate danger. This is more obvious in morally strained or battle-weary troops and if often repeated and long-continued might cause persistent hypertension through overaction of the suprarenals or hypertrophy of the medial coat of the arteries (McDowall 1941). The tendency shown by a large proportion of the few cases re-examined after 2 months' rest to return towards normal blood-pressures, though there had been no change in climate, diet, or dehydration but personal anxiety had been relieved, favours a neurogenic origin of the hypertension.

SUMMARY

In a sample of 695 men from an Armoured Brigade who had experienced at least a year of desert warfare resting pulse-rate, hæmoglobin, and blood-pressure were recorded.

A symptomless hypertension was found in 187 cases (27%). When 33 of the hypertensives were re-examined after 2 months' freedom from battle anxieties, 28 showed a normal pressure.

My thanks are due to the staff of the Oxford Institute of Social Medicine who lent their apparatus and their skill in statistical evaluation of the results.

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EXCORIATION AROUND FISTULÆ

CONTROL BY BUFFERED GELS

C. F. SELOUS
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M SC LOND

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IN operations involving the alimentary tract or pancreas, it occasionally happens that leakages of fluid containing proteolytic enzymes cause excoriation of the skin around the wound or drainage-tube. Such digestion and irritation, if long-continued, is very distressing to the patient. We have observed that until the leakage of digestive fluid ceases, and so the prime cause is removed, the application of standard preparations, ointments, or lotions to the skin is of little value.

By identifying the principal protease present in the exudate, which is presumably responsible for digestion of the skin, it has been found possible to apply a solution buffered at a carefully selected pH such that the proteolytic action is destroyed or reduced to a minimum and which is at the same time compatible with wound healing.

The proteases with which we have had chiefly to deal have been the "pepsin" complex from wounds of the stomach, and the "trypsin" complex from operations on the small intestine, pancreas, or large bowel. In the former case pepsin has an optimum pH of 1·5 to 2·0 and is inhibited above pH 5·0 (Northrop 1931); cathepsin is also associated with gastric juice and probably with most tissues, and this has an optimum pH between 4 and 5, and has no action above pH 7·0. It follows, therefore, that a buffered solution on the alkaline side of neutrality will effectively minimise proteolytic activity arising from such fluid. We have used a pH of 8–8·5 with success.

In the case of fluids containing the tryptic complex of enzymes, an optimum pH for the digestion of proteins and of primary clea
7·8 and the activity … and pH
(Seth 1924). In su … pH 5·4
pH 5·0 bathing the skin should prevent excoriation, and this has been found successful.

The application of dressings soaked in these buff
solution
by

brings the buffer … the same time
surface. Experi … th the affected
buffering power … how that the
addition of the gelling agent. … mented by the

PREPARATION OF SOLUTIONS AND GELS

(a) *Buffer solution pH 5·0.*—10·207 g. of potassium hydrogen phthalate is dissolved in water, 23·90 ml. of 1 N.NaOH solution is added, and the volume made up to 1 litre. To this
5 g. of
and … tH of bacteria
by th … 5·0 measured
used. … the acid-gels

(b) *Gelatin buffer pH 5·0.*—75 g. gelatin is warmed with some of solution (a) until dissolved and the volume made up to 500 ml. with
… ion is saturated with
… pH of 5·0 to 5·1 forms
… 10% gelatin and 5%
gelatin … tried, as has a mixture of 20% starch and 5%

(c) *Pota*
of the
has be
… potatoes, required only 3% gelatin.
About 500 g. of peeled washed potatoes are autoclaved at 30 lb. pressure for an hour. They are th
of the … 300 g.
and … ion (a)
vol
The … The
… to buffered solution.
… essure and while hot
… homogenisor. (An
… chine will serve as
… pH of 5·0 to 5·2.
… tendency to separate out and should not be kept for more than a fortnight.

(d) *Congo red and polyvinyl alcohol gel.*—Recently an entirely new medium for these buffer solutions has been developed. In this the gel-forming properties of polyvinyl alcohol solution when combined with certain cross-linking agents is used. A 1% Congo-red solution in buffer solution pH 5·0 is added to an equal volume of 10% polyvinyl alcohol in buffer pH 5·0 at 50–60° C. On cooling, a clear red gel is formed having a pH of 5·0 to 5·2. It is extremely stable and may be sterilised by autoclaving at 15 lb. pressure without alteration of pH or gelling power.

(e) *Buffer solution pH 8·0.*—6·808 g. potassium dihydrogen phosphate is weighed out and dissolved in water, 23·4 ml. of 2 N.NaOH is added and the volume made up to 1 litre. The pH of this solution is 8·0 at 20° C, and it is used in the preparation of all the alkaline buffer gels.

(f) *Gelatin buffer gel pH 8·0.*—The preparation of this is similar to (b) but the buffer pH 8·0 is used. It is necessary to add 12·0 ml. of 2 N.NaOH to bring the pH to 8·0 owing to the acidity of the gelatin. This alkaline gelatin undergoes
hydrolysis and should be
A clean
but

(
… *vinyl alcohol gel.*—15 g. polyvinyl alcohol is dissolved in 500 ml. of solution (e) by warming to 60–70° C. To the warm solution is added 5 g. borax
of the buffer solu
is almos
may be

… to 8·0.

… ARISON OF BUFFER POWERS

To assess the power of the various preparations to resist changes of pH due to addition of acid or alkali a modification of the original unit of buffer power (van Slyke 1922) was used.

To 100 ml. of the given buffer gel, liquefied by warming, small measured volumes of 1 N.HCl or 1 N.NaOH were added. After shaking, the liquid gel was poured into the electrode chamber of the pH meter and the pH measured when cooled to room temperature. A curve having for ordinates the pH and for abscissæ the milliequivalents of H· or OH′ added was thus constructed. For the acid series of gels the mean milliequivalents of alkali required to change 100 ml. of gel from pH 5·0 to pH 6·0 was read off from the graph, and this figure is used in assessing the buffer power of the preparation. Similarly for the alkaline series the mean milliequivalents of acid required to change the pH of 100 ml. of the gel from pH 8 to pH 7 was found.

BUFFER POWER OF GELS

Buffer	pH	Constitution	Mean B* (pH 5–6)
Solution (a)	5·00	Aqueous potassium hydrogen phthalate	2·0
Gel (b)	5·00	15% gelatin in (a)	1·3
Gel (c)	5·00	3% gelatin + 60% potato in (a)	2·5
Gel (d)	5·00	5% polyvinyl alcohol + 0·5% Congo red in (a)	2·1
Solution (e)	8·00	Aqueous potassium dihydrogen phospate	(pH 8–7) 1·5
Gel (f)	8·00	15% gelatin in (e)	2·0
Gel (g)	8·60	3% polyvinyl alcohol + 1% borax in (e)	2·3

* B = milliequivalents of H· or OH′ per 100 ml.

As will be seen from the table, the buffer powers of the solutions are in every case increased by the addition of the gelling agents. This is most defi
(b) on acc
a
us … of agar in addition … Variations
… were tried and overcame this difficulty.

Undoubtedly on both the acid and the alkaline side gels utilising
combine … preferred since they

… and bacteria and moulds do not grow in … are non-toxic,
them. The material is manufactured by E. I. du Pont de Nemours of USA and is not readily available here at present. It is a vital material in the plastics industry and larger supplies will probably be forthcoming soon. We would emphasise, however, that it is the buffer solution controlling the pH and not the vehicle that is the active agent in these treatments, and that the other gels described are satisfactory.

ILLUSTRATIVE CASES

1.—Male, aged 46. Operation for perforated duoden
ulcer. After 5 days a green d
wound excoriat
fort. Fluid:
buffer gel pH 5
irritation ceased, … tion rapidly subsided and
discharge gradually stopped and incision healed after 28 days.

2.—Male, aged 73. Carcinoma of rectum. Laparotomy and pelvic colostomy. After 12 days a chronic
charge began, giving rise to
the wound. Discharge
buffer gel pH 5·0 applied
varied, using 30% starc
… and 10% agar/30%
starch gels of pH 5·0. The excoriation slowly subsided and discomfort was relieved.

3.—Male, aged 50. Duodenal ulcer. Posterior Polya gastrectomy. Slight discharge causing excoriation developed after 4 days. Fluid: pH 7·4, trypsin +, amylase ++. Gelatin buffer gel pH 5·2 applied, and excoriation subsided in 7 days. Fluid flow gradually ceased and wound healed up after 15 days.

4.—Male, aged 58. Carcinoma of œsophagus. Gastrostomy performed and catheter
was
the … ter 6 days there
and … the skin around
… a pH 5·0. … tube contained free HCl
with a buffer gel of 10% gelatin and 5% agar at pH 8·0. Area around tube was dressed
Soreness and excoriation rapidly diminished.

5.—Female, aged 50. Fæcal fistula following hemicolectomy caused extensive excoriation. Fluid: faintly alkaline trypsin ++, amylase faintly positive. Potato gel pH 5·2 was used as a dressing and the condition improved rapidly and was almost clear in 7 days. Treatment with the same gel was continued but excoriation recurred after 16 days. A sample of the gel examined showed pH 4·7 and it is probable that the increased acidity was responsible for the relapse. Testing a sample of potato buffer gel at intervals shows that it should not be used for longer than 14 days after preparation on account of slow production of acid. Unfortunately this case was transferred and it was not possible to continue the treatment with fresh gels.

6.—Female, aged 62. Biliary fistula following cholecystectomy. An erythematous area appeared around the opening with considerable soreness. Fluid: pH 5·3; bile-salts, pus cells, and a trace of blood present; trypsin negative, pepsin negative. The area was dressed with polyvinyl alcohol buffer gel pH 8·5. The soreness was relieved and after 3 days the skin was clear; the treatment was continued until the fistula closed up.

DISCUSSION

The clinical trials have shown that discomfort and excoriation due to proteolytic enzymes may be successfully overcome by pH control along the lines indicated, and case 6 suggests that it is sometimes possible to use the method in conditions for which digestive enzymes are not demonstrably responsible.

Davidson (1925) and Legroux and Loiseleur (1941) have suggested that the toxæmia of burns and septic wounds is partly due to absorption into the circulation of protein cleavage products from the autolysis of tissues. This autolysis is chiefly caused by the enzyme cathepsin, which is active in slightly acid media, and the rational treatment would seem to be to minimise its activity by shifting the pH to the alkaline side where the enzyme is inhibited. This is the original basis of bicarbonate baths and compresses in the treatment of burns. The use of buffered gels for this type of treatment is now under consideration.

SUMMARY

The preparation of acid and alkaline buffered gels is described and their relative buffer powers have been measured.

By using such gels of the appropriate pH, excoriation of the skin by proteolytic enzymes has been successfully treated.

It is suggested that the same principle might be applied to the reduction of tissue autolysis in burns.

We wish to thank the surgical staff of this hospital for their coöperation, and the Medical Research Council for a grant which made this work possible.

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Reviews of Books

Mosquito Control

(2nd ed.) W. B. HERMS, H. F. GRAY. (Oxford University Press. Pp. 419. 20*s.*)

THERE are more than 1400 described species of mosquitoes. and since their habits, noxious and otherwise, are almost as varied, it is not surprising that scientific mosquito control is a complicated business. Its importance hardly needs stressing, but it is a little surprising to learn that there were 1½ million cases of malaria in the United States in 1932—when the disease was considered to be at a low ebb. Heims and Gray naturally approach mosquito control from the point of view of their American experience; thus, their chapter on the education of the public will be of little direct help to the worker in primitive places. Yet here, as elsewhere in the book, the reader who extracts the general principles and applies them to his own situation will find much which is helpful. Control by drainage, flushing of streams, oils and larvicides, fish, and screens and nets are all dealt with in detail. It is suggested that DDT may in due course replace pyrethrum, except possibly in aerosol sprays. The sections on control in rural and urban areas again approach the situation from a primarily American standpoint, with much emphasis on cemetery urns, duck clubs, and ornamental garden ponds. There is a useful appendix on mosquito identification.

Textbook of Surgical Treatment

(2nd ed.) C. F. W. ILLINGWORTH, MD, CH M EDIN., FRCSE. (Livingstone. Pp. 564. 30*s.*)

IN this second edition the chapter on burns has been rewritten to incorporate the work of Colebrook in Glasgow, so that it now conforms to modern ideas. The use of plasma to restore proteins in the stage of shock is noted, but there is no mention of the administration of large volumes of M/6 sodium lactate solution by mouth for the same purpose. The rest of the book is largely unchanged. There are not sufficient technical details for the book to be of use to those undergoing training in surgery, but senior students reading it will get their values right and gain a sound outlook.

What is Hypnosis?

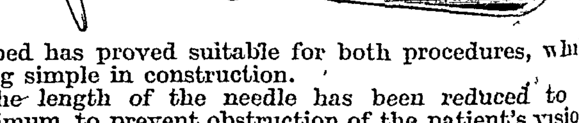
ANDREW SALTER. (Richard R. Smith. Pp. 88. $2.)

THE theme of this essay is that "hypnosis now remains merely a term of convenience. It is all conditioning, and when this is constantly kept in mind hypnosis, or conditioning, becomes an instrument of the most fantastic power, and the person under treatment needs neither faith, nor hope, nor confidence for satisfactory psychotherapy." The writer is a successful hypnotist, ignorant of the objections against explaining every habit and every instance of learning as due to "conditioning," but familiar with some recent scientific writings, such as Hull's on the psychology of hypnosis. He describes his methods of teaching "autohypnosis"—a process which enables the subject to make himself deaf to all noises but the hypnotist's voice and otherwise reduce his field of awareness ("one of my subjects... hypnotizes herself as she rides to school from the suburbs in a trolley car each morning.") He advocates training on these lines for soldiers, since he has produced by hypnosis deafness to air-raid noises played on the gramophone. Fanciful proposals, uncritical explanations, descriptions of skilled technique, and sensible reasons for rejecting claptrap are curiously juxtaposed.

New Inventions

NEEDLE FOR MARROW PUNCTURE AND INFUSION

MARROW puncture and infusions are now an accepted part of modern medicine. The complexity of some of the needles used, and there unsuitability for both diagnostic and transfusion purposes, has led to a search for a more satisfactory design. The needle here described has proved suitable for both procedures, while being simple in construction.



The length of the needle has been reduced to a minimum, to prevent obstruction of the patient's vision and mouth when introduced sternally, and the butt has been made as small as practicable to prevent the needle becoming top-heavy. The bore is of Rec fitting and has been made for use with standard blo transfusion apparatus and equipment. The adjusta guard with slender wings enables the needle to inserted at whatever angle the operator desires, a prevents too deep an insertion. The needle may held firmly in the final position by a strip of adhesi plaster over the wings. A handle is provided to ass control and ease of introduction.

The needle has been made for me by Messrs. Down Br

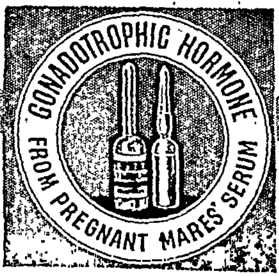
My thanks are due to the Director-General of Medi Services, Royal Air Force, for permission to publish this no I am also indebted to the Commanding Officer and m colleagues at an RAF hospital, and to Mr. W. Middleton a Mr. Cook of an RAF maintenance unit for making numero trial patterns.

E. M. DARMADY, MB, MRCP
Squadron-Leader RAF.

A resting state of
the ovaries may be suspected
in women who (a) fail to develop fully
at puberty, or (b) regress physically after
delivery. The ovaries can be grossly stimulated
by injections of the equine gonadotrophin

GESTYL

either by persistent intramuscular injection; at
daily or short intervals of 400 i.u., or by
single or divided intravenous injection, at
cyclic intervals, of 400 to 1000 i.u.



Such stimulation, though not always followed by overt cyclic hæmorrhages, should be adequate to direct the physical trend toward normality.

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Chemotherapy with 'Albucid'

IN THE COMMON COLD

It is generally held that the common cold is due to infection by a virus against which no chemotherapeutic measures have so far been found to be effective.

In the very distressing secondary infections, however, sulphonamides have been employed with varying success.

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'ALBUCID' SOLUBLE
NASO-PHARYNGEAL SOLUTION

renders this preparation most effective whether in prophylaxis or treatment. Dispersal over the mucous membrane is rapid, penetration is marked, and it can be sprayed or painted on without causing irritation. Non-toxic—it is indicated in the mixed infections of coryza, tonsillitis, laryngitis, œsophagitis, etc.

Descriptive literature sent on request

'Albucid' is the registered name which distinguishes sulphacetamide of British Schering manufacture.

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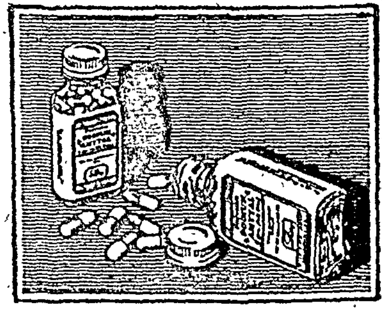
TRADE MARK **'Sodium Amytal'** BRAND

SODIUM ISO-AMYL ETHYL BARBITURATE

in Psychiatric Conditions



Many years of clinical experience have proved the value of 'Sodium Amytal' in disturbed mental conditions. Patients may receive effective doses with relative safety. Psychotherapy may be successfully employed in the "twilight" state which is induced. This method is recommended for treatment of hospitalized cases but may be employed in private homes with adequate nursing supervision. Permanently good results may be obtained.

References: Jour. of Mental Science, Jan. 1941; Jour. of Mental Science, Jan. 1942; Practitioner, Sept. 1942.

ELI LILLY AND COMPANY LIMITED
BASINGSTOKE AND LONDON

THE LANCET

LONDON: SATURDAY, FEBRUARY 24, 1945.

Penicillin in Compound Fractures

THE fourth to the ninth day has come to be looked on as the golden period for wound closure. Thus "delayed primary closure" proved its value in soft-tissue wounds in Italy, and with penicillin to relieve the surgeon's anxiety about sepsis the principle has been extended to the open fracture. In this issue BURNS and YOUNG in England and BENTLEY and his colleagues in the CMF show how amazingly successful penicillin and early closure can be, confirming the Canadian results summarised by MACFARLANE in our issue of Feb. 3. The Botleys Park surgeons have treated 70 open fractures of the femur with no deaths, no amputations, and a maximum shortening of half an inch; they anticipate that 50 of the 70 will have normally functioning limbs within nine months. BENTLEY and his colleagues have treated 62 open fractures of other bones, obtaining primary union of flesh and bone in 58. There is an obvious temptation to go one better—to advocate primary suture at the first operation. Penicillin should theoretically make this possible, and BURNS and YOUNG nod their approval. But this temptation should be resisted. It is not always possible at the primary operation to tell the living from the dead. As CHURCHILL[1] points out, at this stage "recognition of all devitalised tissue is oftentimes impossible . . . disturbances of blood-supply and subtle changes that indicate impending death of tissues may not be detectable." Moreover, after wound excision local oozing is inevitable, and penicillin cannot reach the inside of accumulated blood-clot. Packing the wound for a few days will allow this exudate to escape. Clearly then, primary closure carries an unjustifiable risk. To wait longer than the ninth day, on the other hand, results in the tacking down of the flaps, which lose their elasticity, and allows the skin to organise in the position of slack; to suture the skin then is a formidable operation, necessitating much undercutting. Every day after the fourth gives infection a greater chance to assert itself. Partial suture, as BENTLEY and his colleagues emphasise, is not enough—it still leaves an aditus for infection—so every attempt should be made to close the skin completely, if necessary by cutting flaps or immediate skin-grafting. Any necrotic tissue must be excised before suture, and CHURCHILL from his extensive experience with the CMF declares that the leaving of such dead or avascular tissues behind is almost solely responsible for the failures; to that BENTLEY and his colleagues add the retained foreign body in the fracture area. BURNS and YOUNG have found it safe to suture on clinical grounds alone. "Count your blessings one by one"—no brawny oedema, no gross sloughing, pus minimal. This does not absolve us from taking wound swabs, for if anaerobic organisms are found they are an indication for a longer course of penicillin. BURNS and YOUNG maintain that with such suture gram-negative infection of the wound can be ignored, since the body can cope with it, and the CMF surgeons have also been little troubled by coliforms and *Ps. pyocyanea*; but their technique allows pus to be aspirated off.

There is still difference of opinion as to the virtues of local application. BURNS and YOUNG gave their penicillin parenterally, and they contend that local application may lead to formation of sinuses. In time of war, once the patient leaves the theatre, we naturally try to avoid interference with the wound, and local injections by tube must carry some risk of implanting new organisms: MCKISSOCK and his colleagues[2] have demonstrated how difficult it is to exclude secondary invasion along tubes. No locally injected penicillin will find its way into the crevices of the fissured and splintered bone, and it cannot be counted on to run between packed muscle layers. Systemic administration of 15,000 units three-hourly gives a local concentration in the wound fluid of 2 units per c.cm., and 0·1 unit per c.cm. is said to be adequately bacteriostatic. But BENTLEY and his colleagues, who used local therapy alone or with parenteral injections, rightly point out that only by local therapy can dead tissue be thoroughly soaked in the chemotherapeutic agent: where transport difficulties make the wounded come for operation late, and full excision is not always possible, local penicillin thus has its place. They point out too that though 17% of the staphylococci found in their wounds were penicillin-resistant, the organism would still respond to high concentrations of penicillin, such as could be introduced by local measures. GARROD,[3] on the other hand, thinks that nothing is gained by aiming at very high local concentrations. Where there are associated joint wounds penicillin led through tubes to within half an inch of the joint has advantages, for systemic penicillin will not diffuse into the joint space.

From the point of view of the fracture, the results obtained by BURNS and YOUNG, using below-knee pin-traction and early movements, are remarkably good. Others are claiming equally good results from plaster immobilisation. It has been well said that the successful treatment of a fractured femur depends more on the surgeon than the method. The below-knee pin is certainly highly successful in the routine treatment of the simple fractured femur. The use of "pumping" movements, when pus is present, hardly has textbook approval, but BURNS and YOUNG believe that this unorthodox method is justified by results. The movements they allow are active movements, and pain will prevent the patient tearing his healing tissues.

Altogether we have every reason for satisfaction with the progress in treatment of this severe injury. Penicillin has made infection no longer inevitable in war. As BURNS and YOUNG point out, it may not ensure local sterility or clean healing, but it does ensure that the patient will not die of septicæmia, and relieved from that fear the surgeon can do in the early days of a compound fracture what without penicillin he would not dare to do for months, if at all. But those concerned with the policy of penicillin usage are to be congratulated on having early realised that penicillin was no excuse for delaying or skimping surgery. Like all other chemotherapeutic agents it

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[1] Churchill, E. D. Ann. Surg. 1944, 120, 268.

[2] McKissock, W., Logue, V., Bartholomew, L. Brit. med. J. 1944, ii, 621.

[3] Garrod, L. P. Ibid, Jan. 27, 1945, p. 107.

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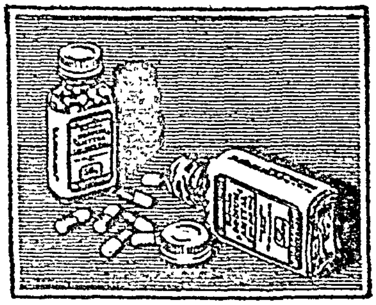

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BASINGSTOKE AND LONDON

THE LANCET

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Penicillin in Compound Fractures

The fourth to the ninth day has come to be looked on as the golden period for wound closure. Thus "delayed primary closure" proved its value in soft-tissue wounds in Italy, and with penicillin to relieve the surgeon's anxiety about sepsis the principle has been extended to the open fracture. In this issue **Burns** and **Young** in England and **Bentley** and his colleagues in the CMF show how amazingly successful penicillin and early closure can be, confirming the Canadian results summarised by **MacFarlane** in our issue of Feb. 3. The Botleys Park surgeons have treated 70 open fractures of the femur with no deaths, no amputations, and a maximum shortening of half an inch; they anticipate that 50 of the 70 will have normally functioning limbs within nine months. **Bentley** and his colleagues have treated 62 open fractures of other bones, obtaining primary union of flesh and bone in 58. There is an obvious temptation to go one better—to advocate primary suture at the first operation. Penicillin should theoretically make this possible, and **Burns** and **Young** nod their approval. But this temptation should be resisted. It is not always possible at the primary operation to tell the living from the dead. As **Churchill**[1] points out, at this stage "recognition of all devitalised tissue is oftentimes impossible . . . disturbances of blood-supply and subtle changes that indicate impending death of tissues may not be detectable." Moreover, after wound excision local oozing is inevitable, and penicillin cannot reach the inside of accumulated blood-clot. Packing the wound for a few days will allow this exudate to escape. Clearly then, primary closure carries an unjustifiable risk. To wait longer than the ninth day, on the other hand, results in the tacking down of the flaps, which lose their elasticity, [illegible] sitating much undercutting. Every day after the fourth gives infection a greater chance to assert itself. Partial suture, as **Bentley** and his colleagues emphasise, is not enough—it still leaves an aditus for infection—so every attempt should be made to close the skin completely, if necessary by cutting flaps or immediate skin-grafting. Any necrotic tissue must be excised before suture, and **Churchill** from his extensive experience with the CMF declares that the leaving of such dead or avascular tissues behind is almost solely responsible for the failures; to that **Bentley** and his colleagues add the retained foreign body in the fracture area. **Burns** and **Young** have found it safe to suture on clinical grounds alone. "Count your blessings one by one"—no brawny œdema, no gross sloughing, pus minimal. This does not absolve us from taking wound swabs, for if anaerobic organisms are found they are an indication for a longer course of penicillin. **Burns** and **Young** maintain that with such suture gram-negative infection of the wound can be ignored, since the body can cope with it, and the CMF surgeons have also been little troubled by coliforms and *Ps. pyocyanea*; but their technique allows pus to be aspirated off.

There is still difference of opinion as to the virtues of local application. **Burns** and **Young** gave their penicillin parenterally, and they contend that local application may lead to formation of sinuses. In time of war, once the patient leaves the theatre, we naturally try to avoid interference with the wound, and local injections by tube must carry some risk of implanting new organisms: **McKissock** and his colleagues[2] have demonstrated how difficult it is to exclude secondary invasion along tubes. No locally injected penicillin will find its way into the crevices of the fissured bone, and it cannot be counted on to run between packed muscle layers. Systemic administration of 15,000 units three-hourly gives a local concentration in the wound fluid of 2 units per c.cm., and 0·1 unit per c.cm. is said to be adequately bacteriostatic. But **Bentley** and his colleagues, who used local therapy alone or with parenteral injections, rightly point out that only by local therapy can dead tissue be thoroughly soaked in the chemotherapeutic agent [illegible] culti [illegible] full c [illegible] has its place. They point out too that though 17% of the staphylococci found in their wounds were penicillin-resistant, the organism would still respond to high concentrations of penicillin, such as could be introduced by local measures. **Garrod**,[3] on the other hand, thinks that nothing is gained by aiming at very high local concentrations. Where there are associated joint wounds penicillin led through tubes to within half an inch of the joint has advantages, for systemic penicillin will not diffuse into the joint space.

From the point of view of the fracture, the results obtained by **Burns** and **Young**, using below-knee pin-traction and early movements, are remarkably good. Others are claiming equally good results from plaster immobilisation. It has been well said that the successful treatment of a fractured femur depends more on the surgeon than the method. The below-knee pin is certainly highly successful in the routine treatment of the simple fractured femur. The use of "pumping" movements, when pus is present, hardly has textbook approval, but **Burns** and **Young** believe that this unorthodox method is justified by results. The movements they allow are active movements, and pain will prevent the patient tearing his healing tissues.

Altogether we have every reason for satisfaction with the progress in treatment of this severe injury. Penicillin has made infection no longer inevitable in war. As **Burns** and **Young** point out, it may not ensure local sterility or clean healing, but it does ensure that the patient will not die of septicæmia, and relieved from that fear the surgeon can do in the early days of a compound fracture what without penicillin he would not dare to do for months, if at all. But those concerned with the policy of penicillin usage are to be congratulated on having early realised that penicillin was no excuse for [illegible] surgery. Like all other [illegible] ng [illegible] it cannot sterilise dead devitalised tissues. The knife is still the touchstone for success. The need to revere skin, and to deliberate before excising any millimetre of it, has been generally recognised. The need for resting the tissues, especially in the early critical days after excision, is no less important. To the surgeons in the forward area who do the first wound excision, rather than to penicillin, is due the main credit for the success of delayed primary closure, and both reports pay tribute to these young surgeons for the thorough primary surgery they have been doing. If we may borrow a phrase from GORDON-TAYLOR,[4] "*Macte virtute, puer esto*. Well done, young man!"

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[1] Churchill, E. D. *Ann. Surg.* 1944, 120, 265.

[2] McKissock, W., Logue, V., Ba [illegible] med. J. 1944, ii, 551.

[3] Garrod, L. P. *Ibid*, Jan. 27, 1945, p. 107.

Traumatic Anuria

FOUR years ago, when the first papers appeared on crush syndrome in air-raid casualties, it was stated that "crush injuries are not new. They are commonly seen on the coalfield, where the treatment is careful nursing and non-interference rather than physiological and biochemical assay."[5] Apparently, however, no such cases had been recorded, and the only previous accounts of the condition were in German descriptions of military casualties of the last war, together with some cases retrospectively diagnosed which were reported in the Messina earthquake in 1910. It was expected that recognition of the crush syndrome in 1–5% of air-raid casualties would lead to its recognition in mining accidents: yet so far only 2 cases seem to have been recorded from mines, one by MCCLELLAND from Canada[6] and the other by A. CAPLAN and G. E. DUNKERLEY from India in our issue of Feb. 3. Discussing the reasons for the apparent rarity of the syndrome in miners CAPLAN and DUNKERLEY remark that it may not be diagnosed—and indeed it often remains undiagnosed even in London air-raid casualties. But they also think that it is genuinely uncommon; for in eight years' experience of accidents in underground workers they cannot recall a previous case of renal failure associated with limb injury. Where falls of stone occur, the miners are either dead when released or die immediately afterwards from other injuries.

Anuria, however, sometimes develops after traffic or industrial accidents, or war wounds, without any long-continued compression. In many of these cases it is hard to know whether the failure to pass urine is due to intravascular hæmolysis, to sulphonamide lesions of the kidney or ureter, to plain dehydration through loss of fluid with inadequate replacement, or to ischæmic muscle necrosis as in "crush syndrome" proper. Many severely injured patients are given sulphonamides and blood-transfusion: many vomit; some do not get enough fluid; and some suffer gross exsiccation because of a not easily displaced (however profoundly misplaced) belief on the part of nurses, and also of doctors, that the more hot-water bottles, electric blankets, radiant-heat cradles, and stoves-under-the-bed are applied to the shocked patient, the better for his "shock." To sort out these various possible causes in any given case, close clinical observation is necessary, and often laboratory or autopsy evidence as well—data that may be difficult to collect under the urgent conditions of military surgery. The series of 8 cases reported in this journal last December by DARMADY and his colleagues[7] illustrate well the difficulties encountered. After blood-transfusion, performed on the third day in case 1 and the fourth day in case 3, jaundice was noted on the following day, with blood-ureas of 72 and 68 mg. per 100 c.cm. Thus the renal defect found after death on the fourth day in case 1, and manifest in case 3 by a uræmia reaching 408 mg. at death on the seventh day, seems to have developed about the time of transfusion; in view of the relatively low initial blood-urea it can scarcely have preceded it. As the investigators point out, histologically the renal lesion of intravascular hæmolysis is similar to that of ischæmic muscle necrosis, and they can be differentiated only by identifying the respective pigments in blood or urine, by finding bilirubinæmia or jaundice (which follow hæmolysis but not myolysis), by discovering the temporal relationships, or by securing direct evidence of muscle necrosis, incompatibility, or hæmolysis of the donor blood. Another of the cases in this series showed gas-gangrene, which is evidence of primary muscle ischæmia: but though it is known that clostridial infection of the blood-stream produces hæmolysis, with gross hæmoglobinæmia and hæmoglobinuria, none of the 4 cases examined post mortem—including this one—had pigmented casts in the renal tubules. Though 5 of the patients received sulphonamide by mouth, no data are given incriminating this as the cause of the anuria, nor were crystals found in the fatal cases. The authors of the paper refer to claims that changes like those of crush injury are found in injuries without any long-continued compression, and in other conditions such as blackwater fever, pyloric stenosis with vomiting, and septic abortion. They consider that a common ætiological basis should be sought, and suggest that the renal changes may be due to anoxia, secondary to hypotension or vascular spasm or both.

The problem is evidently important, since the above 6 fatal cases accounted for a third of the deaths in hospital of 2000 selected casualties from the French battlefield. It is difficult to see how it can be solved except by observers specially detailed for the purpose, since the clinical and laboratory evidence is to be found chiefly in the very early stages of the renal lesion, and as a rule—in ischæmic muscle necrosis at least—chiefly within the first 24 hours of return of the circulation to the damaged part. Some details of the condition preceding wounding, and essential data such as blood-pressure and fluid intake and output are not beyond routine recording; but even such a simple test as the benzidine or guaiac reaction for the detection of hæm pigments in the urine, needs to be performed by someone conversant with its use. Experience is needed to avoid quite simple fallacies. Thus, if a patient is immobilised on his back, catheter urine may appear free from pigment unless care is taken to express the last few drops, by pressure on the abdomen; if the urine is acid, as is usual after injury, the pigment may be present entirely as precipitate or in casts in these last few drops.

It seems most likely that enlightenment will come from special teams, such as that of COURNAND and her collaborators, working on civil accidents, since these do not differ appreciably from battle injuries except in the rapidity with which they are admitted to hospital: under modern battle conditions it would be difficult even for special observers to use those clearance methods of investigating renal function developed by Homer Smith and used by Cournand et al.[8] The results obtained so far by the latter group indicate that renal blood-flow is reduced during oligæmic hypotension: yet, despite the consequent tendency to anoxia, traumatic anuria is rare in "shocked" patients, and some other or additional factor seems necessary to account for it. If anoxia were the principal or sole factor, one would expect a cortical necrosis of the kidney, hitting first the most highly active tubules of the first convolution. This is only very rarely seen after injury,[9] but has been produced experimentally by Scarff and Keele,[10] who cut off the renal blood-supply for an hour or two. In contradistinction, the renal lesion after crush injury and mis-matched transfusion is mostly in the distal convoluted tubule, leaving the proximal ones unaffected.

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[4] Gordon-Taylor, G *Brit J Surg.* 1944, 32, 247.

[5] Harris H A *Brit med. J.* 1941, i, 491.

[6] McClelland, J. C. *Canad. med. Ass. J.* 1941, 45, 332.

[7] Darmady, E. M., Siddons, A. H. M., Corson, T. C., Langton, C. D., Vitek, Z., Badenoch, A. W., Scott, J. C. *Lancet*, 1944, ii, 809.

Restaurant Hygiene

Communal feeding, already gaining in popularity before the war, has increased rapidly in the war years. British restaurants, factory canteens, meals in schools, the Naafi, and numerous other war-time establishments, besides the regular restaurants, "help-yourself" and otherwise, are providing millions of meals every day, while the tea-shop and the ever popular public house provide fluid refreshment. The food and drink supplied come from many sources, are manipulated by many hands, and dispensed to many patrons, so public eating- and drinking-places must offer ample opportunity for the spread of infection. Cutlery and crockery, as well as food and drink, may become contaminated with pathogenic bacteria of both respiratory and intestinal origin, derived from patrons themselves or from the restaurant staff. Considering the lack of any proper sanitary control over them, the wonder is that public eating-places have not been incriminated more often as focal points for the spread of infection. Proof of such an origin would in the case of respiratory infections be hard to obtain in view of the multiplicity of other sources. Intestinal infections have from time to time been traced to food-handlers in restaurants, and with extension in the typing of both intestinal and respiratory pathogens the epidemiologist will in future be able to follow infections more often to their source. Cups and glasses, spoons, knives, forks, and plates are all potential vehicles for the spread of infection, and very few restaurants or public bars could satisfy the hygienic standards required to block this particular channel of spread. Although abnormal demands, shortage of staff, and lack of mechanical appliances make it very difficult to effect the necessary reforms in war-time, it will be generally agreed that for æsthetic reasons as well as for protection of the public health satisfactory methods for cleansing and sterilising crockery and cutlery together with a high standard of personal hygiene should be required, and if necessary enforced by law, in public eating- and drinking-places. The medical officer of health and the sanitary inspector now have no real right of entry to catering establishments except to inspect food and its production. The Food and Drugs Act 1938 demands cleanliness of employees in such establishments, as well as of apparatus and utensils, but there is no specific mention, as there is in the United States inspection regulations, of chipped or cracked chinaware, and in effect there is no official supervision of utensils or their cleansing in restaurants.

Much work on the bacterial flora of crockery and cutlery in restaurants and public bars has been done in America, usually by taking multiple swabs from the washed table-ware, and examining for respiratory and intestinal organisms. A common finding has been the atypical coliform *Bact. ærogenes*, which might be used to indicate the quality of dish-washing as typical *Bact. coli* is used as an indicator of water purity. In an investigation of restaurant hygiene in Providence, USA, Horwood and Pesare[1] found, inter alia, hæmolytic streptococci in 2 of 184 samples (1·1%) of table-ware, *Staph. aureus* in 5·4%, and *Bact. coli* in 1·6%, while Vincent's organisms and *C. diphtheriæ* could not be recovered from any of the swabs. The investigation was conducted in the summer months and might have yielded a higher incidence of respiratory pathogens in the winter. On another page, Linfoot records the isolation of *Staph. aureus* from [illegible] 8, and coliform bacilli [illegible] om the cracks in cups obtained at various restaurants. Presumably if these [illegible] he cracks, they can get out [illegible] that the greatest danger from cracked and chipped crockery is the transfer of ulcerative stomatitis may have substance if a virus of the herpes type is a common cause of stomatitis. The spread of Vincent's angina by drinking vessels has often been suggested, but the considerable doubt about the infectiousness of this condition, and the failure to reproduce the infection experimentally in animals, including the monkey,[2] rather negatives the possibility. On the other hand, various detergents have been found not to destroy influenza virus,[3] which, being viable for some time outside the body, may be transferred by unsterilised crockery.

The institution of satisfactory methods of dish-washing should not be difficult. The trouble in most restaurants is that the dish-water is not hot enough to destroy vegetative bacteria, particularly if the washing is done by hand. As a result the dishes are neither properly cleansed nor sterilised. Conditions are much worse in public bars, where glasses are usually given a quick rinse in cold or tepid water containing, perhaps, some magic cleanser. Here the traffic in human saliva and the opportunities for the spread of infection in this way must be considerable. To add to the problem, staff employed in the menial task of dish-washing are often of the lowest grade of intelligence, poorly paid, and woefully ignorant of hygienic needs and standards. But the obstacles to the reform of restaurant hygiene can and must be surmounted. The technique of satisfactory dish-washing is relatively simple. With manual

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[8] Cournand, A., et al. *Surgery*, 1943, 13, 964.
[9] McFarlane, D. *J. Path. Bact.* 1941, 52, 406.
[10] Scarff, R. W., Keele, C. A. *Brit. J. exp. Path.* 1943, 24, 147.

[1] Horwood, M. P., Pesare, C. P. H. *Publ. Hlth Rep., Wash.* 1942, 57, 33.
[2] Kelly, F. C. *J. infect. Dis.* 1944, 74, 93.
[3] Krueger, A. P. *Nav. med. Bull., Wash.* 1942, 40, 622.

Much of the work done on dehydration in the last few years has merely confirmed principles which were well established in the past. Thus we have known since the time of Ambard and Papin[4] that there is an upper limit to the osmotic pressures found in the urine, and that consequently the fewer the solids to be excreted by the kidney the smaller the volume of urine a dehydrated person will have to pass. This method of saving water has been brought out again and again,[5] and it is clear that a minimum intake of salt and a diet consisting largely of carbohydrate and fat is the best for lifeboat personnel.[6]

TOXICITY OF DDT

The remarkable new insecticide, DDT, is toxic to mammals as well as to insects. Its toxic action is cumulative and it can be absorbed through the skin. Smith and Stohlman[7] find that in cats, rabbits, and rats the symptoms of DDT poisoning strongly resemble those of poisoning by phenol, except that the action of DDT is delayed up to several hours and may persist for several days. It causes hyperexcitability and generalised fine or coarse tremors, which end in flaccid or spastic paralysis, with occasional tonic or clonic convulsions preceding death by respiratory paralysis. Examination of the blood by Smith's method[8] failed to reveal significant amounts of either free or conjugated phenols. Smith and Stohlman have evolved a method for estimating DDT in the tissues by means of the five atoms of chlorine which its molecule contains, assuming that the DDT is present in the tissues unchanged. They macerate and dehydrate the tissues with sodium sulphate, and after extraction with acetone determine the chlorine in the extracts. Modifications are necessary for the estimation of DDT in bile, fæces, and urine. This method gave good results when tested by adding DDT to animal tissues, 80–90% of the DDT added being accounted for. When a rabbit weighing 1·8 kg. was given 0·55 g. per kg. of DDT in olive oil by mouth and killed 2 days later, the DDT contents of tissues per 100 g. or 100 c.cm. were: blood 10·7 mg., liver 6·3 mg. kidney 3·9 mg., brain and spinal cord 16 mg., bile 80·0 mg., and urine 16·8 mg. These figures may be 10–20% too low, but they show how the DDT is distributed in the body.

In rats given 1–5% solution of DDT in olive oil into the stomach the LD50 was 150 mg. per kg.; in rabbits it was 300 mg. per kg. Death may be delayed for several days. Woodward and others[9] give rather higher figures for acute toxicity, ranging from 150 to 750 mg. per kg. for rats, mice, guineapigs, rabbits, and chicks. There were some survivals at the highest doses, probably owing to non-absorption. These workers found that DDT dispersed in gum-acacia was decidedly less toxic than in oil solution. The cumulative effects of repeated small doses were studied both by Smith and by Woodward and his colleagues. In both investigations it was found that 0·05% by weight of DDT in the diet was injurious and that 0·1% usually caused death within a few months. Ellis, Westfall, and Ellis[10] have lately demonstrated that DDT is more toxic to goldfish and frogs than to animals. When given food pellets containing DDT dissolved in olive oil, goldfish first became irritable, and then developed muscular incoördination and spasms, and prostration—a picture resembling poisoning by phenol or picrotoxin. The onset of symptoms was sometimes delayed for 4 days or more, and a single fatal dose took anything from 1 to 6½ days to kill the goldfish. The lethal dose ranged from 60 to 200 mg. per kg. body-weight. Frogs given injections of DDT into the dorsal lymph sac were killed in 4- hours by single doses of 150 mg. per kg., some dying after as little as 10 mg. per kg.

When applied to the skin in a dry form, DDT no toxic symptoms, according to Draize and others Even 4 g. per kg. of undiluted drug had no effect on rabbit's skin applied externally. In solution, however, it can be gradually absorbed through the skin to give toxic effects. The toxicity was not acute; doses of to 2·75 g. per kg. dissolved in dimethyl phthalate and other solvents were not fatal. But daily inunctions of 0·5 c.cm. of 30% DDT in dimethyl phthalate caused death to rats, rabbits, and guineapigs after about 30 applications. Higher rates (4 c.cm.) killed these animals after 5–10 applications, though dogs survived such doses for very long periods. [illegible] applications which were [illegible] general symptoms (anorexia or tremors) after the first dose.

In spite of the pronounced neurological symp produced by DDT poisoning (e.g., tremors, spasticity terminal extensor rigidity), Lillie and Smith[12] repo relatively slight histological changes in the nervous system. In cats, rabbits, and rats these sisted in vacuolation round the large nerve-cells in cord and cerebral motor nuclei. In the liver there a hyaline centrolobular and midzonal degen similar to that described in poisoning by azo and some of its derivatives, with a variable of coagulation necrosis.

The general impression left by the accounts of these investigations is that DDT is quite a serious poison small vertebrates. But its toxicity is limited by poor powers of penetration, and it can only exert effects when dissolved in oil or various organic sol Thus, the statement by Smith that DDT is two or times as toxic as phenol should be qualified. DDT so toxic to insects that only dilute dispersions usually be employed in the field; so the danger to and other vertebrates is remote. The main seems to be to operators who have to handle con solutions.

FEATHERS FOR THE NEST

On St. Valentine's Day Sir William Jowitt, by Mr. Attlee, Sir Archibald Sinclair, Mr. R. A. B and Mr. Ernest Brown, presented a Bill to "provide the payment by the Minister of National Insurance the Exchequer of an allowance for each family at rate of 5*s.* for each child except for the first or only child The allowance will be continued, provided the child still at school or an apprentice, till he is sixteen years age. Though either parent may draw the allowance, is, according to the Bill, legally to belong to the In practice, however, the mother will usually spend money; and since she has to do the job we still think would be more sensible to give the tools into her own hands.

The Government Actuary estimates that there over 2½ million families with two or more children, that the scheme will cost about £57 million during first year. Children for whom orphans' pensions paid are excluded, and adjustments in the allow may be made where supplementary allowances or "under provisions relating to the Services, war in policemen, and firemen" are already being paid. exceptions, and the decision to make the cash 5*s.* instead of the 8*s.* recommended by Sir Will Beveridge, will naturally cause some disapp but the great thing is to have called the allowances existence. It will probably be easier to increase them widen their scope than it has been to achieve them.

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4. Ambard, L., Papin, E. *Arch. int. Physiol.* 1909, 8, 432.
5. Gamble, J. L. *Proc. Amer. phil. Soc.* 1941, 88, 151.
6. See Editorial, *Lancet*, 1944, ii, 601.
7. Smith, M. I., Stohlman, E. F. *Publ. Hlth Rep., Wash.* 1944, 59, 984.
8. Smith, M. I. *Ibid.* 1933, 48, 1487.
9. Woodward, G., Nelson, A. A., Calvery, H. O. *J. Pharmacol.* 1944, 82, 152.
10. Ellis, M. M., Westfall, B. A., Ellis, M. D. *Science*, 1944, 100, 477.
11. Draize, J. H., Nelson, A. A., Calvery, H. O. *J. Phar* 1944, 82, 159.
12. Lillie, R. D., Smith, M. I. *Publ. Hlth Rep., Wash.* 19 979.

COURAGE

LORD MORAN'S *Anatomy of Courage*[1] is an essay on the nature of courage in fighting men, illustrated by a diary which he kept as a battalion medical officer in the war of 1914–18. Those who shared his experience will relive the familiar scenes here described with artistry and insight. He brings back that torn countryside of death, with its muddy trenches gashing the soil, the slippery steps into dark damp dug-outs, lit by the guttering candle so often snuffed by the blast of shell-fire. The reader almost feels anew the pitiless rain and the searching winds of the rolling country of the Somme; the familiar smells of Maple Copse and Delville Wood steal once more into another war-time air. A nostalgia for departed youth will descend, not unpleasantly, on many an ageing man who thirty years ago was living the hard and selfless existence of a battalion "MO." Lord Moran does more than paint the sombre battle country; he gives us glimpses of villages behind the lines, of those wonderful periods of leisure, of deep sleep between sheets, of old people and children gathering at the cottage doors to smile wistfully at the departing men when the end of rest inevitably came and singing soldiers took their way back to their calvary beyond the golden corn. He gives us brilliant portraits. And like a thread of silver running through the narrative the medical reader can trace and appreciate the anxiety of the doctor for his men, can sense something of the service given to them, and something, too, of the pain with which he sometimes had to harden his heart and send them back to their duties.

In the analysis of courage some perhaps may feel that Lord Moran has a less certain touch. Often he shows an almost uncanny understanding of the discontents of fighting men and their sources; yet elsewhere there seems to be a sudden failure of appreciation of a soldier's inner thoughts and fears. Describing the battle dreams of nearly all fighting men, he rightly insists that "we cannot cleanse our thoughts of fear by repression of the doubts and hesitations which 'occupy and mock the minds of men' in war." Thus and in many other vivid phrases he shows his remarkable insight into the war disorders of the mind. But many will question his view of death in the field as "a fine free setting forth . . . which comes to a man in the spring time, before age and disease have soiled his body and the traffic of cities stained his soul." Such a view is not likely to appeal to a young soldier; indeed it is probable that he would have a word for it in lively disagreement. "Whom the gods love die young" is surely a resigned and tame negation of all that a doctor should stand for. On another page Lord Moran portrays a good soldier shaken into a stupor by a near miss, and concludes: "When this sort of thing happens to a good fellow it is final." This again seems unjustifiably hopeless in a therapeutic sense. In this war the sergeant would retire to a Corps exhaustion centre little further away than the transport lines of the old war, and would have a very good chance of returning to his work in a fortnight. Instead of which, in the old war, "he must be hurried away to a shell shock hospital with a rabble of *misshapen creatures from the towns*." This was an extract from the diary, and it may well be that it does not express Lord Moran's present views. It is not always the townsmen who break in war. Indeed, it is certain that neurosis and delinquency are highest in units in which intelligence is lowest. Such units are to be found among countrymen, especially when composed of men drawn from rural areas in which inter-marriage, bad housing, and mental deficiency are indigenous. Surely the Cockney soldier is of historic stout heart, and what of the Clydeside battalions from Glasgow?

"Courage," writes Lord Moran, "is a moral quality." Later he writes, "Courage is will power." These two statements are bound to have great weight coming from such a source. There is obviously much truth in both; yet we cannot help reflecting that Lord Moran writes too exclusively of courage as seen in war. The idea that courage is will-power is one that has been strongly stressed by the psychological department of the German High Command, which is much interested in the readiness of the soldier to apply his will to military acts. But courage is a living function of a man's mind, and can be found in all sorts of situations apart from those of war. Thus there is the courage of the conscientious objector, of childbirth, of the conference chamber, of the cat burglar playing with discovery and sudden death as his stakes. And there is an amazing courage to be seen even on the scaffold. It is true that will-power must enter into many of these examples, but the derivation of all of them from moral qualities is more questionable. Such conceptions as these merit our careful attention, and discussion is likely to be exhaustive among readers of the *Anatomy of Courage*.

As for the future, Lord Moran points out that "when an army is being trained to fight it must begin by weeding out those whose character or temperament makes them incapable of fighting." This is the very kernel of military mental hygiene. He insists that this is not possible as a result of a brief interview by recruiting boards; a careful process of combined testing and observation is what is necessary during the [illegible] aining. This is a matter [illegible] psychological investigation, [illegible] the Services and is produc[illegible] ture holds a desperate nee[illegible] sed wherever it can be found. It is all too scarce, as Lord Moran hints. The mechanisation of war means that heavy demands are made on the more intelligent for the manufacture, maintenance, and care of a legion of mechanical contrivances, which inevitably means that an ever smaller proportion of man-power is available for the actual fighting, whether on land, at sea, or in the air. Yet the less intelligent can be used if properly placed. That will be the task of sel[illegible]

The book ends with a [illegible] and the reader is left with an u[illegible] having to read the whole again. It expresses the author's pride in his country's fighting men, his devotion to the soldier in his trials and triumphs, and his bitterness for him when folly and the pursuit of ease have deprived him of the right equipment and the right leaders. In reading its burning and burnished English, we are tempted to modify a sentence of Christopher Morley's: "Every soldier has his own private crown of thorns; but what matters is whether he can wear it over his ear." That ability the British soldier has possessed for centuries; but one day he will ask who places the crown on his brow every time he must march to war.

HOSPITAL FOOD

A leading article and three special articles on this subject appeared in our columns last month. A number of readers have asked us to supply copies for distribution to hospital committees and others interested. Accordingly we have reprinted the articles as a small booklet which is obtainable from THE LANCET Offices, 7, Adam Street, Adelphi, London, WC2, price 6*d*. (postage 1*d*.).

A BRITISH COUNCIL FOR REHABILITATION has been formed, which aims, inter alia, at securing the active cooperation of commerce, industry, and professional bodies in the problem of resettlement. Mr. H. E. Griffiths is chairman of the executive committee, whose members include Mr. E. S. Evans, Dr. F. R. G. Heaf, Dr. Donald Norris, and Dr. F. S. Cooksey.

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1. The Anatomy of Courage. By Lord Moran, MC, FRCP. Constable. Pp 216. 8s.

Special Articles

THE WOUNDED IN THE LOW COUNTRIES AND GERMANY

FROM OUR SPECIAL CORRESPONDENT

(*Concluded from p. 220*)

A new type of hospital has come into existence during this war. This is the 200-bed general hospital, which combines the services and the amenities of a base hospital with great mobility, and takes up a position, in relation to the fighting, which is geographically much the same as that of the casualty-clearing station. Its function is, however, different from that of a CCS, for it is a holding hospital. The period for which cases can be held varies very much. according to the operational position of the troops in whose area it stands. And in a time of emergency it may act very much as a CCS.

A Mobile General Hospital

The hospital I visited was the first general hospital to be set up in France, on D-day plus 3, about a mile from the Normandy beaches and not very far from Bayeux. Its next move was to Falaise. Another of the operations in which it assisted was that of St. Hubert and St. Vith. In the early days of the campaign in France the daily turnover of admission and discharges was very high indeed.

The hospital had often had to make long jumps from one site to another, the longest to date being from Amiens to a town between Louvain and Hasselt. And the fact that a 200-bed general hospital exists which can make these rapid moves is in the present conditions of warfare a useful asset.

To make rapid moves possible the detail of packing and transport has had to be thought out to the last packing-case, and as it is essential that movement should be possible by night or by day, in darkness or light, the marking of each case has had to be so contrived that it can be identified by touch. This has been done quite satisfactorily by a system of raised markings, which one recognises easily, whereas incised markings proved difficult and unreliable. The amount of lorry transport required is about twice that used by a CCS, and the men who accompany the lorries and pack each of them are the men who as a rule handle the equipment in the wards, operating-theatres, stores, and other departments. The most difficult part of the packing and removal is that of the well-equipped laboratory, and this takes time. But if need be, enough of the hospital to enable it to undertake acute surgery can be ready to move in two hours, and it can open in two hours when the move is completed. After moving, the hospital can have 150 beds working in twelve hours.

EQUIPMENT AND STAFF

This hospital has sheets on the bed and full-scale medical comforts, and broadly speaking it functions like any other general hospital. Its medical staff includes a surgical specialist, and it can have as many surgical teams attached to it as may be required; during the campaign as many as seven teams have been attached at one time. There is also a dental officer with a laboratory for making dentures, and a specialist in mechanical work who has about twenty years' experience. There is a specialist in ophthalmology, and a technical assistant with a full range of lenses and frames who can fit almost any kind of spectacles within an hour. The pressure on both the dental and eye services is heavy and continuous. The hospital carries a staff of matron, assistant matron, and twenty sisters.

A feature of this hospital, as of other medical formations which I saw, is that it has in its establishment a of three padres. They represent the Church of England, the United Board (Nonconformist), and the Roman Catholic Church. Everyone to whom I spoke had only the highest praise for the padres' work, and several people approached me to draw attention to the valuable services they perform both in action and in the wards. The padres seemed to be an integral part of the hospitals or other medical arrangements I visited, in the same way as the medical officers. And this is a [illegible] was my experience in the long-ago [illegible]. It is perhaps symptomatic of a still bigger change in the Army organisation; for all services, all troops, all forces seem to pull together better and more understandingly than they did in that ancient period.

Besides the surgical, dental, and specialist ophthalmologist, the hospital also carried a medical specialist, a radiologist, and an expert in anæsthetics. Anæsthesia is, I was told, largely induced by 'Pentothal.'

The pioneering work of this hospital was done in England before D-day, by the present commanding officer. That is, the pioneering work of its organisation. To arrive at the detail of a war establishment and to cover every detail of transport and packing was the work of this very hard-working enthusiast. Without danger to the war effort it may be revealed that before the war he was a general practitioner; though he also knew the importance of being a soldier for purposes of military medicine, and much of his training was got in a field ambulance.

A department of the organisation in which rigid economy had been exercised was that of administration, represented by a quartermaster, a company officer, and the commanding officer himself. And that was the whole staff. At the time of my visit the CO seemed to be carrying out most of the administrative duties himself, owing to the absence of others on leave. But it is an understood thing in the hospital that any officer may be called on, in emergency, to discharge any function. Much of the success of this particular organisation must be put down to the drive and initiative of its commander.

RELATIONS WITH CIVILIANS

Among other things, the hospital has the happiest and most cordial relations with the people of the little Belgian town where it was situated at the time of my visit. The children of the schools collected—and in these days it is a matter of very great difficulty to do so—no less than 500 fresh eggs for *les blessés*. The townspeople, I was told, were almost embarrassing in their generosity. Someone would suddenly arrive, deposit a present of fruit (Belgium is rich in apples) or something else, utter the words *Pour les blessés*, and disappear without leaving name or address.

The particular town in which the hospital was standing was in an agricultural area, where eggs and other goods can be obtained, as is not the case in most parts of the country. Belgium as a whole is suffering severely from shortages, and food of all kinds is very scarce.

The hospital reciprocated the kind actions and generous feelings of the townspeople by arranging a Christmas party and giving presents to children and to patients. But the CO had a real problem with the givers of presents to the hospital, and solved it by printing a card from "The Officer Commanding, Officers, and Men of the Military Hospital, X'" thanking all for their gifts and inscribed with the name of each person to whom it was addressed. Among both British and Belgians there will be pleasant memories of the hospital's stay in this little town.

Comparisons with 1940

The base medical arrangements of the British Liberation Army in 1945 show interesting differences compared with those of the first armies in France during 1939 and 1940. When I visited GHQ at Arras in May, 1940, and toured the then static front along the hypothetical

Maginot Line—a few concrete positions and a lot of anti-tank ditches, slit trenches, and barbed wire—I found that there was a definite hangover as regards organisation from the war of 1914–18. The conception of mobile warfare was, as it were, diagrammatically represented on maps; but the physical possibility of mobile warfare, in the sense of masses of transport, armoured fighting vehicles, and fighter and bomber planes, was more potential than actual. And when I saw field ambulances and casualty-clearing stations installed with heavy equipment in permanent buildings I was moved to ask: "And how do you move?" I received a reasoned reply to my inquiry, although in some cases in May, 1940, it had begun to seem hypothetical that any move would occur. But the fact remained that field ambulance and CCS [illegible] heavy loads of medical and [illegible] o transport to carry it was [illegible] was also the immense medical base at Dieppe, with stores, hospitals, and more stores, and more hospitals. The Germans who captured it later could give a better description of it than I, because they got there before I did; and indeed I never saw it. Unfortunately Hitler had conceived the idea of visiting Holland, Belgium, and France with his armies just at that time. These armies were highly mobile and there was no deficiency of either fighter or bomber planes.

The spirit of our armies was excellent at this pre-Dunkirk period; the medical organisation was very [illegible] past experience and past [illegible] we had at that period a [illegible] its headquarters in England, where it still remains. Already there were being worked out plans for "defence in depth" and the mobile warfare which that means. But the medical services had still to get the training of the desert and other campaigns, and the other forces and services of the Army had still to catch up with the organisation and equipment already developed in the German armies. What is notable now is that while the medical services have had to cut down weight carried in their mobile formations—field ambulance and CCS for example—and have acquired transport to make them fully mobile, they have not had to change fundamentally.

The medical service has developed the paratroop field ambulance which is specially equipped for its odd method of arriving at the scene of action. But the function of the "para" field ambulance is essentially the same as that of any other field ambulance, adapted to the conditions which may necessitate surgical cases being held for days beyond front-line positions. The light field ambulance has been developed to meet the needs of armoured formations, but it is still a field ambulance. And so it is with all the branches of the medical service. The use of surgical teams in advanced surgical units has arisen out of the conditions of mobile warfare. The use of penicillin is the gift of Providence, neither foreseen nor hoped for, and this has led to one of the most important changes of treatment during the war. The advance in neurosurgery and faciomaxillary surgery are surgical developments of last-war experience and of clinical developments in the inter-war period.

CHANGED BASES

Big changes have been brought about in base hospital arrangements by two factors: (i) the decision, taken before the war as a result of far-sighted strategy, to create an Emergency Medical Service out of the voluntary and publicly controlled civilian hospital and medical civilian services of Great Britain; and (ii) the development of our air power and the increasing use of air transport. The base of the operations of the medical services of the BLA since D-day has no longer been in France or Belgium but in Great Britain. This has saved the use of an immense amount of shipping space in carrying stores and equipment of all kinds to the Continent.

The base hospitals for the BLA now existing in France and Belgium, and soon possibly to exist in Holland and Germany, are advanced base hospitals with advanced supply depots.

This development would have been impossible but for our increasing predominance in the air and the increasing availability of air transport for medical services. Almost a third of all casualties are now evacuated by air from the BLA to Great Britain, and the proportion is likely to rise. This line of evacuation by air to Great Britain will become still more important as the line of communication lengthens into Europe. And the longer the line of evacuation the greater will be the proportional saving in the [illegible] It looks as if [illegible] air evacuation [illegible] have importa[illegible] where distances are even greater.

Advanced Base Hospitals

The large general base hospitals which I saw in the towns of Belgium and France were singularly lucky in the buildings in which they were situated. One building had been erected for a hospital by the Belgians before the war, and was complete but had not been opened by them when the Germans arrived. The Germans opened it and when we occupied the town later we took over from the Germans. It is a tall building, spacious, well lighted, and well equipped. Running from the floor up to the top story is a continuous curving ramp which takes the place of stairs, and up which you could drive a small car. In this hospital first-class neurosurgery, faciomaxillary surgery, and chest surgery are being done, as well as other work of a great surgical centre.

Another building taken over was also occupied by the Germans, and they had left there a large number of their own wounded in very bad condition. The Germans are not using penicillin, and they give blood by direct transfusion instead of our own more highly developed and superior method. So septic were some of the cases that a German nursing sister who volunteered to give blood to a gravely wounded soldier—the operation [illegible] carried out by the German [illegible] septicæmia in two days. S[illegible] saved by British treatment. The large quantity of instruments, dressings, and apparatus the Germans left behind them, as well as the orderlies, nurses, and doctors (some apparently with only three years' training) throw an interesting sidelight on the qualities and deficiencies of the German army medical service.

Evacuation and Convalescence

The base hospitals in France and Belgium are admirably equipped, and capable of giving any kind of treatment required. They do not hold their patients as long as the EMS hospitals in Great Britain—although they have every facility for doing so—because they are part of the operational set-up. To these base hospitals the CCS and hospitals in forward areas clear their casualties, and for the reception of these casualties accommodation must always be available. But this group of base hospitals, distributed over a wide area, acts as a cushion to take the pressure from the front-line areas. And this group of base hospitals is linked up by lines of air and sea evacuation with Great Britain. The necessary air-field and ports are there, and can if necessary be greatly extended. The transport planes are there, and also the hospital carriers and hospital ships. I saw an ambulance train go out from a base in Belgium to the coast, and it was well equipped except that it had supports for stretchers instead of bunks. It had food, medical attention, nurses, and orderlies on board, and it had the certainty of arriving at its port of disembarka-

tion and of sending its wounded on by carrier to arrive in Great Britain in scheduled time.

Excellent as air evacuation is, it is more liable to *interruption than evacuation by sea—most often by* reason of bad visibility at one or other end of the journey. The ambulance train I saw off on its journey to Great Britain took a collection of men who had been waiting for air transport for two days.

Many patients who recover quickly from wounds or illness do not need to be evacuated to Great Britain. For these men and women there are good convalescent arrangements. If some of the people who object to the ATS going overseas could see the arrangements made for their medical care—and for their recreation and short leave—in France and Belgium, they might take a different view of the subject. The French and the Belgians—and our own troops are largely in contact with the Belgians—are exceedingly friendly. In France and Belgium we are in very friendly territory indeed.

If an ATS is ill near Brussels with some minor trouble, such as a bad cold, there is first-class accommodation where she can stay and recuperate for a few days in pleasant surroundings. I saw two of these places where girls were kept for a few days; they were cheerful and warm and the girls were very well looked after. I also saw two convalescent homes—one for men officers and one for women officers—in beautiful country near Brussels; my only criticism is that the conditions were so comfortable as to tempt the patient to try to prolong his stay. And while I was in Brussels I learned that a large convalescent home for ATS other ranks was being opened under similar conditions in a large building, well equipped in all ways and having in addition an excellent gymnasium.

The two convalescent homes I saw—and at one of which I lunched very well—were being run by the British Red Cross and St. John Organisation and there was a pleasant homelike atmosphere about them. The ATS other ranks' convalescent home is in the same district as the other two—a lovely country district amid woods which will be beautiful in spring and summer.

Achievements of the Medical Services

The Army medical organisation in 1940 had already reached a high standard, and the health of the troops was very good. Developments since then, in all branches of the work of an army, have thrown a tremendous strain on the officers and men, but the standard remains high.

To compare conditions in 1945 with conditions in 1915 is to realise what great advances have been made in simple hygiene, and what great changes these advances have made in the sickness-rate and the level of health.

There is still mud in Flanders, and there is much on the borders of Belgium, Holland, and Germany. But the mud does not pervade the soldiers' lives as it did in 1915. The soldier moves more from place to place; he has more use of transport, and is better supplied. Also the mobile bath units in the fighting areas enable him to keep clean to a degree undreamed-of in that earlier war.

Louse infestation and scabies on the scale common in 1915 are unknown. They are now rarities, not commonplace. And with them have gone a mass of skin infections. The soldier of today knows a great deal about how to keep himself well; he has an idea of "positive health," of keeping fit, which is higher, much higher, than in 1915.

The preventive services of the Army have protected him against tetanus so that, if not unknown, it is now a rare disease. In 1914–15 there was often no tetanus antitoxin available for acute cases, and there were many acute cases; in 1945 the universal immunisation with tetanus toxoid has prevented the tetanus occurring at all.

Epidemics—typhoid, cerebrospinal fever, and so on—just do not exist, and the ordinary sick-rate from illness is not a high one, because general health conditions are good. The preventive and hygiene services of the Army have done a magnificent job.

SURGERY

The treatment of surgical casualties has been revolutionised by (i) the rapidity with which first-aid is brought to the wounded and their speedy removal from the field, (ii) the bringing of surgical specialist assistance to the wounded in advanced positions and shortly *after the* time of wounding, (iii) transfusion with blood and other fluids soon after wounding, and (iv) the use of penicillin and other modern chemotherapy. This surgical work is done in very advanced positions when necessary, but for a large number of casualties such early advanced surgery is not necessary. Many cases are, of course, "walking wounded" and with appropriate treatment are able to resume duty quickly.

For severe surgical cases there is every requisite facility for further treatment in the advanced base hospitals, as I have called them—that is the large general hospitals of the BLA in France and Belgium. There is, so far as I know, no kind of case which cannot be dealt with in the general hospitals if the condition of the wounded man demands it. But for operational reasons it is clearly better to send cases needing prolonged and continuous treatment back to the United Kingdom.

The proof of the pudding is in the eating, and the proof of the efficiency of the medical services of the Army is in the very high recovery-rate of all casualties, medical and surgical.

FINAL IMPRESSION

From the fighting line to the great modern hospital at the base of the BLA, the medical services work as one integrated coördinated and smoothly moving organisation. They have first-class medical, surgical, and other specialists, and eminent consultants whose work during the war has added largely to their experience. They have also a team of medical officers with units, with field ambulances, with CCS's, and with other hospitals, who have learned their work in years of war. They have experienced staffs of sisters and of trained hospital personnel. And with the combatant units and field ambulances there are MO's and other ranks, many of whom are veterans of several campaigns during the war.

The medical services have at all the places I visited the happiest relations with other branches of Army administration. Their importance in ensuring the fitness of the soldier is better understood by the non-medical services than it has been hitherto. This integration of fighting forces and ancillary services together in the BLA, this understanding and appreciation of each other's problems, this mutual confidence one in the other, is much greater than it was in 1914–18. Medical services and fighting forces are in this war, it seems, raised to a higher level of efficiency. The cause for which we are fighting is better understood than the cause we fighting for then. And because of these things th morale of the Army is very high. The men I saw on m visit to front-line positions in Belgium and Holland an Germany were "on their toes" for the fight in whic they are engaged.

More Pharmacists.—At the end of last year there we 25,285 persons on the register of the Pharmaceutical Societ of Great Britain, compared with 25,224 the year before. Th total includes 4471 known to be serving with HM Force Since 1900 the number of pharmacists has increased by 10,000 and it is now 1 per 1800 of the population. The percentag of women pharmacists is 10·5, and last year 52% of t entrants were women.

SCIENCE IN PEACE

AT a conference held last weekend in London by the Association of Scientific Workers Prof. J. D. BERNAL, FRS, said that the standard of life in this country in the next few years would largely depend on how adequately and intelligently science is employed in industry. "In the past industry has [illegible] of producing cheap go[illegible] of the uses and quali[illegible] the work[illegible] industry [illegible] of the wh[illegible] in their working hours, no less than their leisure, with the possibilities of worthwhile and interesting lives." This required the deliberate thinking out of industrial techniques and the application of science to them at every step.

Mr. HAROLD ROSE held that the outstanding social and political problem of the day was housing. Millions of homes would be required within the next few years, and the building industry must be reorganised and modernised to produce them efficiently and economically, utilising the large potential capacity of the engineering and aircraft factories. Traditional building methods must be [illegible] offered [illegible] e every advantage mean " [illegible] bricated " did not than th[illegible] was nothing more [illegible] ethods to building construction, so that the greater part of the normal site operations was carried out in the factory. At least six tons of water was used in the construction of a normal brick house, all of which had to dry out before habitation; prefabrication implied [illegible] could be occ[illegible] systems and k[illegible] and the whol[illegible] hours. [illegible] reduce [illegible] quality [illegible] If we seriously set our minds on getting millions of houses by non-traditional methods," said Mr. Rose, "they can be produced."

Speaking on health, food, and agriculture, Mr. F. LE GROS CLARK suggested that one of the first measures taken after the war should be to revert to first dietetic principles and get back to protein. It was in protein, and especially protein of animal origin, that the world's population showed the most obvious deficiency; and this deficiency had become serious during the war. It would take some time to raise the proportion of animal protein in the diet of about half the human race. But it [illegible] was possible to expand the cultivation of the soya bean [illegible] to produce strains with [illegible] he extraction of protein [illegible] leaves and the use of yeast should also be investigated. Secondly it was necessary to develop the breeding of good dairy cows, adapted to the purposes of every type of community, climate, and fodder. And thirdly, the potential harvest of the seas and inland waters must be explored: in many parts of the world the food resources of the fishing areas were relatively unknown and no measures had been taken to increase them and make them available. "We have become aware of the nature of protein deficiency in the course of the war," said Mr. Clark: "we have turned this island into a small experimental field for the raising of our available protein supplies. What we have apparently forgotten is that our trivial war-time deficiency or near deficiency is small in comparison with the protracted protein deficiency of half the human race. What we have to do is to turn from the pioneer or experimental stage to the large-scale application of method to every part of the habitable globe; and that will require a great team of biochemists and agronomists." A beginning should, he thought, be made with an intensive study of the technology and economics of food distribution and transport, and of the type of administrative machinery required to relate production more and more closely to human needs. Special attent[illegible] all to the sta[illegible] i.e., transp[illegible] that we ar[illegible] are likely to realise the largest reductions in the final [illegible] it is here that we price."

Dr. Hor[illegible] scienti[illegible] the pa[illegible] people have failed to benefit from these advances owing to the lack of development of the medical services in this country. "Private interests should not be permitted to prevent the full development of a National Health Service, and we ask that medicine be removed from the market-place."

REMUNERATION OF PRACTITIONERS

PURSUING their plan outlined last summer (*Lancet*, 1944, ii, 223), the Minister of Health and the Secretary of State for Scotland have appointed a committee to recommend "what ought to be the range of total professional income of a registered medical practitioner in any publicly organised service of general medical practice . . . with due regard to what have been the normal financial [illegible] in the past and t[illegible] practice future the prope[illegible] g in the [illegible] the status of general medical practice and its power to attract a suitable type of recruit to the profession." The members of the committee are:

Sir Will Spens (chairman), master of Corpus Christi College, Cambridge; Dr. J. A. Brown, Birmingham; Dr. O. C. Carter, Bournemouth; Mr. E. Davies; Sir Ernest Fass; Dr. W. M. Knox, Glasgow; Mr. T. Lister; Mr. J. L. Smyth; Dr. S. A. Winstanley, Urmston.

Sir Ernest Fass is a former public trustee, Mr. Lister an accountant, Mr. Davies a solicitor, and Mr. Smyth secretary of the social insurance department of the Trades Union Congress. The medical members, who are all general practitioners, were nominated by the British Medical Association. Mr. H. F. Summers, of the Ministry of Health, and Miss A. V. Kelynack, [illegible] assistant [illegible] will act as [illegible] be addres[illegible] London, S[illegible]

WAR INJURIES COLLECTION

AFTER the [illegible] Army Medica[illegible] n in 1941 of the the Royal Co[illegible] the museum of Council accep[illegible] edical Research [illegible] from the War Office and the Royal College of Surgeons of England that they should assist with arrangements for forming a comprehensive National Collection of pathological specimens, photographs, and drawings of war injuries, which would serve both for [illegible] the types [illegible] permanent record of special s[illegible] present conflict. A [illegible] of the Council's War Wounds Committee was appointed to direct the scheme; this subcommittee includes nominees of the three Fighting Services, the Ministry of Health, the Department of Health for Scotland, the Royal College of Physicians of London, the Royal College of Surgeons of England, and the Ministry of Pensions. The arrangements for the collection were entrusted to Dr. Joan Ross, who is acting as temporary curator.

A large number of [illegible] lated, and by [illegible] an [illegible] held in the [illegible] 1, Wimpole Street, London, W1, [illegible] till Friday, March 9, from 9 AM until 6 PM, both days inclusive. It will be open to all members of the medical profession, but not to the general public.

The exhibition will consist mainly of specimens, photographs, and drawings of wounds sustained in the land fighting in Italy and north-west Europe, which have been collected with the coöperation of the Army Medical Department. It will include museum specimens collected by Dr. Ross; coloured photographs by Mr. P. G. Hennell (by courtesy of the Metal Box Co., Ltd.); and drawings by Mrs. M. L. Wright and Mrs. Ehrenborg. It is hoped that all medical men or women having specimens of relevant interest to offer to the National Collection will communicate with Dr. Ross, Science Block, Mill Hill School, NW7 (Mill Hill 3010). It is intended that after the war the specimens collected shall be distributed to appropriate museums and teaching institutions.

In England Now

A Running Commentary by Peripatetic Correspondents

To the social historian of today I commend the advertising columns of the *Times.* Here he will find a reliable mirror of the habits and customs of our people—the monetary value they attach to their goods and chattels, the names they give their children, their mourning habits, the vagaries of charitable appeals. A striking feature of the *Public Appointments* column these days is the demand for hospital dietitians. Unless there has been a sudden rise in their occupational mortality our hospitals have taken very much to heart the strictures being passed on their catering habits. There is a curious variety in the titles of these posts. In one recent issue there were three such advertisements; one hospital wanted a "dietitian," another a "food supervisor and dietitian," and the third a "lady kitchen superintendent." A few days earlier a Lancashire hospital had been advertising for a "food supervisor," and that sounds to me the best name. Having spent part of my school-days in the Palatinate, I have always retained an affection for this hard-headed, plain-speaking county where spades are spades. What other title would fit the official responsible for preparing menus of hot-pot, tripe, pig's trotters, and eccles cakes, varied occasionally with fried fish and chips, not to mention that most delectable of cheeses that even in the days of peace was well-nigh unobtainable in London? No lady kitchen superintendent could produce that dream of a hungry man, a Lancashire hot-pot; not the miserable apology that passes for such in the south, but the real thing that stars at hot-pot suppers. And "dietitian" suggests illness, calories, vitamins, and the rest of the scientific or pseudoscientific jargon of this new science of nutrition. We are at last realising that our patients' well-being depends as much on the taste, serving, and variety of their food as on its scientific analysis.

* * *

I was rather surprised and pleased, when my WAC (I) staff-sergeant handed me an invitation to her sister's wedding, for our opportunities of seeing Indian domestic life are limited, and a uniform acts as a kind of negative passport. The invitation itself was a notable document, not only containing time and place but also placating the curious by giving the occupations of the bridegroom and the bride's parents. The reception was held in a small room, with rows of chairs like a classroom or political meeting, and on a sofa opposite the door the bride and bridegroom, heavily garlanded and prepared to face all comers. I committed the solecism of shaking hands with the bride as well as the bridegroom, which is apparently not done, though it is pardonable in an ignorant foreigner. After our entry we sat down, and just went on sitting down for half an hour, while later arrivals came in, and a gramophone played what I am told was wedding-music. This was a trying time, as readers of Beverley Nichols's remarks on Indian music will realise. I was then asked if I would "take a little lunch," the time then being 7 PM Indian standard time, and we went into a small room where a table was laid for twenty people. "Laid" is perhaps an exaggeration, for there were only brass plates, on a scale of one per guest, each plate containing some highly spiced nuts, a sickly-sweet doughy ball, not further identified, and a banana, bursting at the seams. The nuts were very hot, and I longed for some *pani,* but all I got was a cup of very sweet coffee. After we had plied our fingers sufficiently, a cloth was passed round with which to wipe them, and I suffered by being low down on the rota. I asked my VCO, who was next me, what happened next, and to my dismay he replied "seats are now resumed." I dreaded a further session of gramophone music, but to my relief we passed the door leading back to the reception-room and went out by another door, where we fell into the hands of what I can only describe as an assembly-line of ushers, modified for India. My first intimation that anything was amiss came when the first usher poured scent over my hair, which is not used to such treatment. The second man decanted a brown fluid, said to be sandal-wood emulsion, over the back of my right hand, using a small ladle. The third dabbed a few minims of attar of roses on the same place: the fo[illegible] handed me a small bouquet "to take away"; and the fifth gave me a cocoa-nut. Then we were released. Later on, as I attempted with indifferent success to remove scent from hands and hair, I decided that I was glad to have seen an Indian wedding, that I was grateful for my hosts' kindness, but that in future I would take the advice of Virgil—*Ex uno disce omnes.*

* * *

Last week I saw a charming lad of 20, but he was an enuretic. He had seen dozens of doctors since early childhood and some of his phrases came out so pat that he was obviously telling an oft-told tale. He had been a stammerer as a boy, but had got over that. Two points in his story struck me:- one was that he was a very deep sleeper and an alarm-clock even by his head was no use; the other was that when he was living alone in a shack, doing his own cooking, bedmaking, and laundry—i.e., going to bed without fear of enuresis and its unpleasant consequences—he had six months' freedom from it, whereas now it occurs twice a week. He was in his public school fifteen, but was a day-boy. I wish I could have helped him more than I did, as he seemed to have all the healthy instincts.

The last case before this which I encountered was over a year ago, a child of 10 who was sent to see me alone. After considerable denial on his part and persuasion on mine (2 Mars bars) he did admit that he was sometimes aware that he was passing water in bed. Then I got a lovely spontaneous sentence from him—"It feels like sliding down hill"—obviously, my dear Watson, the pleasure bribe to the infant to empty his bladder being translated into the swinging-riding sensations so attractive to childhood. I had heard he ha[illegible] this boy, so I painted him a rather [illegible] life—God forgive me—in which he and the Captain played decisive parts, an alluring picture in which wet beds were unthinkable, since when save for one night in an air-raid he has been dry. But we see so few cases that we are apt to fall into the *ab uno disce omnes* heresy. That's the worst of being a GP.

How much more fortunate is my colleague who is chairman of a medical board! He says he has seen dozens lately. A recruit will sail through his examination, but when he comes up to the chairman and is asked if he has anything to say, out comes his "No, I am very fit, but since I was a boy . . .; and there are mother, sisters, aunts, all waiting in the wings, ready to confirm and console. Really, I do not see why this disability which does not impair a man's fighting capacity should rob him of the privilege of serving his country. One might have enuretic regiments or even a division. They would be very successful in damp climates—the rainy season in Burma—or in night operations.

* * *

Cycling, they tell me, strengthens the muscles, ventilates the lungs, tones up the myocardium, and exercises the kidneys. I have even seen it said that it prevents piles, cures fistula-in-ano, and is one form of prophylaxis against that dread nightmare, an enlarged prostate. And yet I don't like it. Being a hospital non-resident, and having laid up the car for the duration, I thought I should maintain and prolong a fast-vanishing youth by adopting this (?) praiseworthy mode of travel. In summer-time it is endurable. Then one can enjoy the salutary effect of halcyon skies and balmy breezes; one can arrive home stimulated by the sunshine, and positively revel in the increased body-content of vitamin D. But the summer is short. Now with an envelope of snow, a floor of ice which negatives each of Newton's three laws, and winds direct from the polar regions, it is definitely not worth while. One advantage however this cycling has given me—a closer association with my fellow employees of the hospital. Cycling à deux renders our common antagonist—whether it be wind, rain, snow, or merely gravity—much less formidable. And one gets to know some points of view other than one's own, or those of one's own immediate sphere. The nurse, the technician, the masseuse, and the porter all have opinions on the modus operandi of the hospital, of which the consultant, secure in his little shell, has no inkling. For the democratic doctor perhaps this broadening of the mind compensates for the rigours of winter? No; I cannot convince myself of that, but I do believe that when it's all over I shall look back on my cycling career with pleasant memories.

Parliament

LARGER GRANTS TO MEDICAL SCHOOLS

IF the universities are to play their proper part after the war, they will have to spend much more than before the war, and Sir John
Excheque
was clear
be met b
recognised … government, he said,
equally ove … would not be spread
during the … grant to universities
… of the decade would need to be substantially increased above the level proposed for the next two years.

The University Grants Committee have recommended that the present annual vote for the universities of £2,149,000 should be increased for each of the next two financial years by the addition of £2 million for general university purposes, by £1 million for developments in the medical schools arising out of the recommendations of the Interdepartmental Committee on Medical Schools, and by £500,000 for grants for teaching hospitals as recommended by that committee. The Government have accepted these recom-
ee also estimated
ar prices) will be
medical schools,
Government recognise that a substantial proportion of the money will have to be provided from the Exchequer. In view of the restrictions on building, it seems unlikely that the universities will have opportunities for any considerable capital expenditure during the next year or two, and Sir John Anderson thought it would be sufficient to include in the Estimates for the coming year a token sum of £250,000 for distribution by the University Grants Committee, without prejudice to what may be necessary in later years.
was including in the 1945
grant in aid of universities, c
teaching hospitals in Great Britain.

Dr. EDITH SUMMERSKILL asked what period of grace the Chancellor proposed to give medical schools which now admit only men to make

FROM THE PRESS GALLERY

Supplies in Liberated Europe

IN the House of Commons Mr. RICHARD LAW, Minister of State, said that lack of transport created almost insoluble economic difficulties in particular regions and there was inevitably very great hardship. But that did not mean that there was a serious overall shortage of food, or that the problem would be solved, or even eased, merely by pumping quantities of foodstuffs into ports already strained to capacity. France was producing as much foodstuffs as she did during the enemy occupation, and great quantities of food formerly taken by the German army were now available to the French people. The principal difficulty in France was distribution and, in the main, transport. In Belgium local production, together with SHAEF's imports, which were rapidly being increased as the produce of last harvest became exhausted, would be sufficient with proper distribution to attain the present target of 2000 calories per head per day which had been set. But in the view of the British Government the collection and distribution of foodstuffs in Belgium had not been satisfactorily organised. In the liberated areas of Holland difficulties had been increased by the continuance of military operations. Increased supplies however were coming in, and the situation was rapidly improving. But the most formidable problem would arise only when the enemy-occupied areas had been liberated.

The criticism that UNRRA had responsibilities for supplying France, say, or Belgium which it had been unable to discharge was entirely unjust. UNRRA could not intervene in any country unless it was invited by the government concerned. Both in France and Belgium the governments had preferred to take on this responsibility for themselves, in so far as it had not been, of necessity, a milit
mean that other
finance the relief
wish to hand over this responsibility to UNRRA, or that UNRRA would not have work to do that would tax its capacity to the utmost.

For the past two
had been working … uthorities
plans, the essence … effective
… was that there should be a military period, when the areas liberated would still be in the immediate war zone, and a civilian period when fighting had ceased, or at least had passed out of the area concerned. It
first period the … t during the
carried out su … ould only be
The energies of … authorities
had been … in the field of supplies
ter … ned to first-aid. The long-
of … the national economy, and
… of the standard set for the military period, belonged to the civilian period. This was by no means confined to food-supplies; it involved re-starting the whole economic life of the countries concerned. It was at this point that the national governments
French. Prov … to take over. The
Government … and the Belgian
grammes for … their import pro-
competent British and American … this year, and the authorities had been instructed to facilitate procurement against these programmes so that
as shippi … for shipment
had, of … Governments
grammes … in these pro-
steps tow … Preliminary
ment … Netherlands Govern-
… already been taken.
… appreciated as fully as
… the vital importance of
… the battle. … countries in the wake

Internal transport was one of the main problems. Since D-day 7500 lorries had been sent to the SHAEF area (i.e. France, Belgium, and liberated Holland) for civil purposes. The reconditioning of ex-Army lorries was already under way. The present production was 100 a week and was expected to rise to 350 a week by the end of March. The ultimate target was 750 a week and it was hoped to provide
They were concerting with
to speed up locomotive
hundred locomotives had … sent to the Continent for the use of SHAEF and a further 200 would be sent in the near future.

The requirements of the liberated areas were in direct competition with urgent militar
Law was confident that o
that the British and the
doing everything in their
… and that they understood that the main objective (theirs as well as ours) must be to bring the war in Europe to an end at the earliest possible moment.

In reply to a question by Mr. H. NICOLSON, Mr. LAW defined the position in regard to appeals by private organisations and others for the relief of civilians in Allied countries. In all but exceptional cases money collected in this country would have to be spent in the purchase of goods in this country. Goods of the kind most commonly required were in short supply and facilities to buy them could as a rule be given only to the purchasing agencies of the Allied Governments or to UNRRA. In the case of goods or articles which an individual or a society was able to spare from among those in his or its possession, it was essential that the appropriate Government department should be consulted before any appeal was issued, since otherwise rationing and other regulations might unwittingly be infringed. Subject to this, however, collections of certain kinds of goods, such as spare garments, might serve a very useful purpose. Goods so collected would have to be placed at the disposal of an Allied Government or of UNRRA who would arrange with the military authorities for the transport. The approval of the Allied
concerned should therefore be secured before any
was launched. The Government warmly
with the motives which had inspired the wish

by several city and municipal authorities to adopt towns in liberated Europe, but they considered that the procedure was scarcely appropriate now and might well raise false hopes in the very different circumstances obtaining today.

Blighted Areas in Scotland

In the House of Commons on Feb. 14 Mr. T. JOHNSTON, Secretary of State for Scotland, moved the second reading of the Town and Country Planning (Scotland) Bill which like the English Act passed last year deals chiefly with blitzed and "blighted" areas. The blighted areas, Mr. Johnston said, were the main planning problem, for in Scotland there was appalling overcrowding. Many of the houses were totally unfit for human habitation, and many more fell deplorably short of modern standards, or were too small for family life. The overcrowding survey before the war showed that 34·5% of the houses in Greenock, 39·4% of the houses in Motherwell, and 39·7% of the houses in Clydebank were overcrowded. The 1941 census showed that in Coatbridge 23% of the houses had only one room, and about 50% had only two rooms. In parts of Glasgow and in some of the other industrial towns the density of population was as high as 127 houses, or more than 700 persons, per acre. The densities in the large English cities were only about half as high as that. Under the Bill the local planning authorities would be able to apply to the Secretary of State for orders authorising the compulsory purchase of land in these blighted areas, which required to be redeveloped as a whole, and of land to accommodate the overspill of their population and industry, and to replace their open spaces. The Bill did not provide for financial assistance to local planning authorities in the acquisition of land in the blighted areas.

Local Government Adjusted

On Feb. 15 the Commons discussed a motion by the MINISTER OF HEALTH approving the proposals of the recent white-paper on local government (*Lancet*, Jan. 13, pp. 57, 63). Mr. Willink said that the Government had three main objectives. Local government would stand or fall by those whom it could attract to its service and he hoped that a reasonable proportion of younger men and women would be chosen as members. In much of the work of local authorities women had more natural interest and often more expert knowledge than men. This was true of the health services, of housing, of maternity and child welfare, and, not least, of the care of children who had no normal home life. A high standard of local-government officers was no less important, and their recruitment, qualifications, training, and promotion were now being considered.

The second objective was to assure local authorities a greater measure of stability than at present so that they might make long-term plans. The third and pressing necessity was that Parliament should encourage vigorous and confident work throughout the local-authority field. How could authorities be expected to press on with urgent plans if they felt themselves to be in peril of extinction, and the negotiations now going on in connexion with the National Health Service necessarily assumed that the present main structure of local government would still be in existence when that service came into operation.

The proposal for a boundary commission appeared to have met with pretty general approval. Some change should perhaps be considered in the minimum limit of population for an application for county-borough status, which since 1926 had been 75,000. The general directions to the commission might also deal with the linking of town and country areas within an administrative county. It was proposed to appoint a special body to advise the Government on local-government problems in London. Fine as the work of the authorities within the county had been during the war, no-one, said Mr. Willink, was satisfied with the present lay-out of the metropolitan boroughs and the London County Council, and the Government desired to deal with these problems with all expedition.

Turning to finance he said that the block grant, which was based on the aggregate expenditure of all local authorities and was distributed among the authorities [illegible] on the basis of their relative needs, was a form [illegible]entary income to local authorities, and the poorer the authority the greater was its share. Even before the war it was recognised that some revision of the formula was due. Also the recalculation of the total grant, which should have taken place in 1942 had not been made and the local authorities had suffered a substantial loss. The Government proposed to deal with both these problems as soon as possible, and there would be a bias in favour of the poorer authorities.

Social Insurance

In the House of Lords on Feb. 15 Lord NATHAN pressed for early legislation giving effect to the policies outlined in the white-papers on social insurance and industrial injury insurance which, he said, were not a programme but only a promise of one. The success of the social insurance scheme was dependent on the Government's ability to keep the cost of living stable after the war by the same methods as during the war; and the Minister of National Insurance should be required by statute to review the rates of benefit and the rates of contribution periodically in relation to ruling prices. It was essential that occupational disability should be the basis of assessing assistance and that there should be reconsideration of the retirement pensions. The need for speed was overriding, for the demobilised armies must not find this great reform still in the pigeon-holes after the last shot had been fired.

Replying for the Government Lord Woolton, Minister of Reconstruction, reminded their [illegible] to provide family allowances has already been introduced in the House of Commons and he said the Government were going to introduce a Bill on the industrial injury insurance scheme. Other legislative proposals included the main insurance Bill, but it would be foolish to say when it would be ready, or when Parliamentary time would be available for its introduction. Now the Minister had been appointed however, they had been able to go ahead with the administration. From April 1 next the existing schemes of health insurance, pensions, and unemployment insurance, now administered by the Health Department and by the Ministry of Labour and National Service, would be administered by the Minister of National Insurance, Sir William Jowitt. Certain duties in connexion with workmen's compensation would be taken over by the new Ministry from the Home Office. The determination of old-age pension appeals would be taken over from the Health Department, and as from April 1 the Minister of National Insurance would become responsible to Parliament for the work of the Assistance Board. The Bill to deal with the break-up of the poor-law must come last, for it would not be right to deal with that until the main Bill dealing with the new rates of insurance had been settled. The transfer of all this work would involve the transfer of about 6000 people. On one issue, added Lord Woolton, he could not give any satisfaction whatever. The Government had quite definitely rejected the linking of benefits to subsistence rates. Frequent variations of benefits according to a cost-of-living standard was going to be difficult in what was primarily an insurance scheme. We wanted people to come back to this country, Lord Woolton concluded, to work here and to be happy here, to feel that they had some reasonable hope for their own development; and that, he held, was the principle of social stability—he would not use the expression social security.

QUESTION TIME

Paper for Educational Books

SIR E. GRAHAM-LITTLE asked the President of the Board Trade *whether he is aware of the dissatisfaction in univers* and scientific circles because the paper control exercises censorship of publications through the allocation of the pap pool by a small committee whose activities are conduct without any opportunity of public criticism; and if he w widen the membership of this committee and state t principles upon which they are instructed to proceed.—Mr. DALTON: I am aware of the dissatisfaction in the universit and schools about the shortage of educational books. T small reserve of paper is set aside with the very object relieving the shortage of these and other essential books. T committee which advises me on the distribution of th reserve consists of an independent chairman, Sir Walt Moberly, and four representative publishers, and it works c the broad principle of helping publishers to produce books of special importance, particularly educational books and [illegible] which they cannot find paper from [illegible] am glad to say that I have recently [illegible] an increase in the allocation to the [illegible] to relieve the shortage of [illegible] so to make any alteration [illegible] nt time.

Day Nurseries

Mr. H. McNeil asked the Minister of Health if he was aware that his decision to close day nurseries had caused deep disappointment to many working-class mothers and had evoked protests from a number of local authorities; that nursery schools were not a substitute for nurseries as their function was different; that the post-war housing situation would make these nurseries an essential social service; and was he prepared to receive representations on the subject.—Mr. H. Willink replied: The war-time nurseries have been provided at the cost of the Exchequer as an aid to war production. They have been provided as a war service under emergency powers and those powers cannot be used to provide a normal welfare service.

Rehabilitation for the Deaf

Mr. F. Messer asked the Minister of Pensions if there were any rehabilitation centres in this country for the deaf and hard of hearing similar to those in the USA; whether there was any clinic, other than that at Manchester University, in which standardised tests were made of the capacity of ex-Service or civil deafened patients to benefit from different types of aids to hearing.—Sir Walter Womersley replied: I am making inquiries as to the scope of the work done at the centres referred to. Standardised tests are conducted by aural specialists at each of my regional offices to determine the most suitable type of aid-to-hearing appliance for ex-Service and civil deafened pensioners. In addition to the one at Manchester University, there are also special clinics at certain of the London hospitals, which are consulted in cases of difficulty.

Accommodation for the Tuberculous.—Mr. Willink said that the latest returns show that local authorities in England and Wales have provided 20,000 beds for the tuberculous and that the number of patients waiting for institutional treatment is 4500.

On Active Service

AWARDS

CBE

Colonel N. C. Speight, FRCSE, NZMF

OBE

Colonel R. A. Anderson, MB Dubl., RAMC
Lieut[illegible]
Li[illegible]
L[illegible]tia, RAMC
M[illegible] L. Jowett, FRCSE, RAMC
Colonel W. J. Officer, MB Edin., RAMC
Lieut.-Colonel M. H. P. Sayers, MB Lond., RAMC
Captain H. M. Jamison, MB Lond., RAMC
Captain L. N. B. Rata, IAMC
Captain Kevin McCall, LRCPI, RAMC

MC

Lieutenant K. C. Stephenson, RAMC
Lieut.-Colonel Alexander Burns, MB Glasg., RAMC
Captain J. W. R. Battram, MRCS, RAMC
Captain Duncan Mitchell, MB Belf., RAMC
Major V. S. Sodhi, IAMC
Captain K. C. Gupta, MB, IAMC
Captain P. C. Sarkar, MB, IAMC
Captain B. G. Kiddle, IAMC

MENTIONED IN DESPATCHES

Surgeon Lieutenant G. J. Potts, MRCS, RNVR

COMMENDED

Surgeon Lieutenant F. J. Gilmore, RNVR
For good services in fire fighting after an explosion at Leith Docks.

Pathological Society of Great Britain and Ireland.—A meeting will be held at St. Thomas's Hospital Medical School on Friday and Saturday, March 23 and 24.

Letters to the Editor

INTRAPERITONEAL CHEMOTHERAPY

Sir,—I hope your timely leading article of Feb. 10 will stimulate a greater use of intraperitoneal sulphonamides, for if suitable drugs are correctly employed many lives will be saved and much unnecessary suffering avoided. I would add a few personal points which may be of value, having employed and studied the method for five years and used it in upwards of 300 cases.

Application, although not standardised, is best done via a saline suspension warmed to body temperature; 4–10 ounces of saline is usually necessary according to the amount of drug used, and the suspension should be squirted into the abdomen as a fine jet from a Record syringe, without a needle or rubber tube. This will guard against clumping of the particles, which is liable to cause trouble as the drug tends to remain in situ and afterwards to be discharged as a lump or become walled off. Introduction via an indwelling catheter, for the same reason, is not wise because a large quantity tends to accumulate at one point.

Dosage should depend on the amount of contamination and pus present. Pus should always be sucked out or mopped away as carefully as possible [illegible] the drug. I have [illegible] sulphapyridine and have been well satisfied with the results, but have had no opportunity as yet of employing penicillin owing to the shortage of supply. I would end by briefly describing a case recently under my care.

A young schoolmistress, with a history of 48 hours' abdominal pain and vomiting, exhibited extreme abdominal rigidity and tenderness and was very toxic. General peritonitis from a ruptured appendix was diagnosed and confirmed at laparotomy. A huge quantity of pus and debris was sucked out of the abdomen and a ruptured pelvic appendix removed, 20 g. sulphapyridine was squirted into the peritoneal cavity before closure and the abdomen drained by two stab holes, the paramedian incision being clo[illegible] was up on the fifth postoperati[illegible] hospital on the tenth day, and tr[illegible] rail, a journey of 400 miles, on the [illegible] little drainage beyond a slight discharge for 4–5 days and the wound healed by first intention. Her doctor has since written to tell me that she is very fit.

Aylesbury. R. H. Gardiner.

RADIO-FREQUENCY CURRENTS IN TUMOUR TREATMENT

Sir,—The suggestion made by two radio engineers, Mr. Forsythe and Mr. [illegible]

MEASUREMENT OF VITAL CAPACITY

SIR,—Even from this distance I feel I must reply to the letter from Dr. D. R. Davies and his colleagues in your issue of Nov. 18 last. I am glad that independent observers have put my method to trial, and would like to make the following points in reply.

1. My own comparative observations with the spirometer were made on 51 students during their physiology course.
2. My method does *not* measure vital capacity, which by definition is the maximum expirable air.
3. How can the increase of heights of the four "cones" be "measured independently and show marked individual variations" when the sum of the increases is only 2 to 5 cm., as measured by "L"?
4. The probable error worked out from 30 consecutive measurements on each of 2 subjects was 8·7% (182 ml. approx.).
5. Vital capacity is the *maximum* expirable air, and my definition of lung expansion is the *maximum* volume increase of the chest. Therefore it is correct to take not the mean of successive readings, as in chemical estimations for example, but the *maximum* of a series of observations.
6. The error between two successive measurements with the spirometer made on students, who are at any rate used to handling apparatus, is often 400 ml., or about 10%.
7. Spirometers are not available in Army outpatients departments, and the errors in observations on personnel completely untrained in the use of apparatus, such as gardeners or apprentice bricklayers of 18½, are likely to be very great. But these men can take a deep breath.
8. The value of my method is that it is an easy clinical test; it has proved useful, and has an accuracy of 10%. But it is *not* claimed that it should replace a tried physiological measurement.
9. It is possible to take the figures away and calculate them at leisure.
10. It has been found that if spirometer readings are taken on physiology students on several successive days, an "improvement" of l litre in vital capacity can easily be obrained provement" of 1 litre in vital capacity can easily be obtained by "training." This surely must be due to increased skill in using the apparatus.
11. It is true that the calculations are sensitive to the measurement "L," but it is easy to make this measurement to 1 cm.; an error of half an inch is unnecessarily large. The difference in volume resulting from a difference in measurement of 1 cm. is in a small chest 200 ml., in an average chest 340 ml., and in a very big chest 610 ml., approximately, not between "500 and 1500 ml."

India Command. H. K. GOADBY.

FUNCTIONAL DISORDERS SINCE D-DAY

SIR,—Cases referred to a South Coast hospital by Army medical officers for specialists' opinions have shown new features since D-day. Though the number of cases I have seen in the last few months is not large, the proportion showing these features has been high.

In past years the cases seen have corresponded in distribution with other reported series. For example, of 77 seen in September–November, 1943, 22 were suffering from psychoneurotic disease, or psychosomatic disease with evident psychogenic element, 16 from dyspeptic conditions with smaller psychogenic element, and 14 from respiratory conditions. They were drawn, as cases still are, from units training in the area. In September–November, 1944, symptoms were not greatly different, but when histories were taken two main groups emerged:

1. Men who had served efficiently in anti-aircraft batteries for years, but had been transferred to infantry when AA defence on its former scale was no longer necessary.
2. Men who had been wounded, and after care in hospital, broke down on resuming training, with symptoms out of proportion, or not in physical relation, to the injury.

In group 1 the conditions for which the men were referred included effort syndrome, breathlessness on exertion, emphysema (slight), catarrh, and dyspepsia. The average age was 32, and it would be expected that men of that age, especially with histories of respiratory or digestive illness, would stand transfer badly.

[illegible]up 2 comprised 20 men wounded in France or the [illegible] who were referred under such headings as cardiac investigation, chest pain, effort syndrome, very doubtful hæmoptysis, scar adherent to pleura, blast (?), and mitral stenosis. In 9 the main complaint dyspnœa on exertion, and in 6 persistent pain; 3 ca presented as dyspepsia (2 having radiological evidence of pathological appendices), and 1 had tremor and loss of weight. In the 18 radiologically normal cases physical examination was negative except for hyperæsthesia. Nervous disturbance was admitted by 6, but in history or on general clinical examination the remaining 12 showed no evidence of psychological lack of adjustment such as was plain, for example, in the 22 psychoneurotic cases seen in September–November, 1943. The average age was 27.

Until D-day it was agreed that the war neuroses common in 1914–18 were now uncommon. But the above figures seem to show that they are appearing again. If these men had not been wounded, their symptoms would probably have been more easily recognised as psychogenic. Their physical recovery preceded their emotional readiness for combat. What seems t be necessary is handling of the recently wounded wit a view to preventing neurosis, restoration of physical capacity by thorough rehabilitation at an early stage and grading of the training of units containing such men. They are probably not as fit as they appear.

Royal Sussex County Hospital. W. A. BOURNE.

PNEUMOCOCCAL LOBAR PNEUMONIA

SIR,—The paper by Dr. Dick in THE LANCET of Feb. 3, and his letter of Feb. 10 commenting on our paper of Jan. 20, raised matters of considerable importance in the use of sulphonamides in pneumonia. It seems to us that the views expressed in his article are open to serious criticism. Three-quarters of cases of pneumonia would recover without any sulphonamide whatever. We have no clear means of knowing before the final outcome whether or not any given case would be in the unfortunate quarter. All cases therefore must have chemotherapy. It is generally accepted that the more serious cases will only respond to an adequate concentration of the drug in blood and tissues. Dr. Dick disputes this view on what we consider to be very inadequate evidence. The division of 161 cases of pneumonia into two groups of 126 cases with a drug level under 6 mg. and 35 cases with a drug level over 6 mg. per 100 c.cm. is so disproportionate, statistically, that any comparison must be, to put it mildly, of little value. The analysis of the temperature reactions to the drug 96 hours and 144 hours after commencement of treatment is also unsatisfactory. A temperature response to sulphonamide (especially sulphapyridine) is generally obvious after 48 hours. Many cases of pneumonia are not admitted to hospital until the third or fourth day, and after the sixth day natural defervescence may occur at any time. The detailed analysis of 17 patients with a low drug level, all of whom recovered, is really unwise; 17 such recoveries would be by no means rare without sulphonamide treatment at all. The high incidence of complications (5 cases) may be of greater significance than the absence of deaths, but here again the figures are too small to warrant conclusions.

With so many variable factors deciding the outcome in any given patient, only large numbers and [illegible] cases can be used to assess the significance [illegible] factor such as the blood-concentration of [illegible] A much sounder method is to observe the effe [illegible] the blood-level of the drug in a patient who [illegible] well on the ordinary dosage and whose blood-level [illegible] low. This we have often done and we are quite convinced that in such cases to increase the dose of the drug, parenterally if necessary, can be a life-saving measure. Our experience is so convincing (to us) that we are prepared to blame inadequate doses of the drug as the ma[illegible] cause of death in certain patients.

So far as Dr. Dick's letter is concerned we should like to point out that we have never suggested that sulphamezathine is more efficacious than sulphapyridine. Experience with several hundreds of cases treated with sulphamezathine convinced us of its low toxicity, though toxic effects undoubtedly occur. We have seen moderate leucopenia in a few patients and dangerous leucopenia [illegible] one case after heavy and prolonged dosage. We have observed the serious complication of crystal formation [illegible]

choose between the various drugs. Sulphamezathine has decidedly fewer side-effects and is both safer and more pleasant to take.

Our main reason for writi[illegible] state categorically that Dr. [illegible] efficacy of a fixed dosage of [illegible] tive of the clinical conditi[illegible] absorption, are dangerous, and that we profoundly disagree with his conclusion.

W. A. RAMSAY.
R. W. LUXTON.

Crumpsall Hospital, Manchester.

LOCALISATION OF FOREIGN BODIES

SIR,—In his extremely interesting article of Dec. 9, 1944, Dr. Brailsford complains of the number of unsuccessful operations for removal of foreign bodies. These unsuccessful operations are mainly due to error in judgment on the part of the surgeon, because, as Dr. Brailsford points out, a large number of foreign bodies are best left in situ.

Dr. Brailsford omits one important point concerning foreign-body localisation. Over five years' experience of Army radiology has taught me that the time factor is one of the [illegible]. When a rush of patients c[illegible] ake accurate localisations in e[illegible] procedure should be carried out only in difficult cases. A general hospital is often called on to work on a CCS basis, with a rapid turnover of patients, only retaining such patients as cannot be moved on. The result is that a rapid stream of patients passes through the X-ray department, followed by successive streams as convoys arrive.

My practice is to screen as many of these gunshot-wound cases as possible. This was essential in the Middle East in earlier days when films were scarce. If the foreign body or bodies are small and innocuous, no marks are made on the skin. If I consider that the surgeon may wish to know the site for possible operation, anterior (or posterior) and lateral (or medial) marks are made, depending on the position of the foreign body. If thought necessary, films may be taken [illegible] a drawing of the [illegible] body is included [illegible] ings are usually a sufficient guide to the surgeon, and I must say I have not seen "many unsuccessful operations for removal"

During the screen examinations I decide which case requires accurate localisation. If any case is thought to be difficult from the surgeon's point of view, a depth measurement is given quite rapidly by the use of Scott's localiser, a simple method which records a scale on a film. This is fairly accurate. The Army supply all X-ray departments with the McGrigor localiser, which is an accurate method; I have, however, found that a simple scale method is speedier when speed is necessary. The number of cases requiring accurate depth measurement is relatively small.

Dr. Brailsford quotes your leading article of Oct. 28, 1944, which stated that "field surgical units have facilities to produce those rough plates which are all that the forward surgeon requires." What are "rough plates?" Perhaps they are the plates kept unwashed in the operating-theatre for three days or more. The surgeon who relies on "rough plates" will be asking for trouble.

Usually it is useless to give a depth measurement for abdominal foreign bodies, because they often move in position. Extraperitoneal foreign bodies deeply placed in the posterior abdomen are difficult and require very accurate localisation. The main radiological investigation for abdominal foreign bodies should be directed to determining the presence or absence of gas in the abdominal cavity. This is best done by first taking a lateral view with the patient on his back, when air can be seen between the liver and the anterior abdominal wall. A view is then taken from the side with the [illegible] This information [illegible] geon than the foreign body. [illegible] nsidered complete [illegible] vis. [illegible] stress the import[illegible] n and radiologist. Many of the troubles of both can be avoided if they take the small trouble of consulting each other, especially concerning the more difficult cases.

JOHN A. ROSS.

BACTERIOLOGY OF RESTAURANT CUPS

SIR,—Much has been written about the dangers of infection arising from the cracks found in the cups in public cafés and restaurants, but little appears to have been done to discover what such dangers may be. I have now studied the bacteriology of about 20 cups obtained from various public restaurants. In general, no organism has been found which could be blamed for an outbreak of diphtheria or typhoid, but the findings suggest that if such organisms were to obtain a footing, then the particular article might be a danger. All the pottery used for the tests was carefully washed and then held in a stream of boiling water for 15 seconds. The article was then broken down the original crack and a culture made from the break. The cultures were made on blood-agar, McConkey's agar and glucose-broth. In all cases, cracks on the side of the cup from which the user would drink were used. In no case was a sterile result obtained. The findings were as follows:

Cup no.	*Culture from crack*	*Growth*
1	*Staph. aureus*	free
	Hæmolytic strep.	free
2	*Staph. aureus*	free
	Non-hæmolytic strep.	scant
	Hæmolytic strep.	scant
	Non-path. spore-bearer	moderate
3	*Staph. aureus*	free
	Non-hæmolytic strep.	free
4	Hæmolytic strep.	free
5	Hæmolytic strep.	free
6	Hæmolytic strep.	free
	Staph. aureus	scant
	B. proteus	scant
7	*Staph. aureus*	scant
	Hæmolytic strep.	scant
8	*Staph. aureus*	moderate
	Non-hæmolytic strep.	scant
9	*Staph. aureus*	moderate
	Bact. coli	scant
	Non-hæmolytic strep.	moderate
10	*Staph. aureus*	moderate
	Non-hæmolytic strep.	moderate
11	*Staph. aureus*	moderate
	Non-hæmolytic strep.	free
12	Non-hæmolytic strep.	free
	Bact. coli	scant
13	*Bact. coli*	scant
	Non-hæmolytic strep.	free
14	Non-hæmolytic strep.	free
15	*Staph. aureus*	free
	Non-hæmolytic strep.	free
	B. fæcalis alk.	scant
16	Hæmolytic strep.	moderate
	Staph. aureus	scant
17	Hæmolytic strep.	moderate
	Staph. aureus	scant
18	*Bact. coli*	free
	Staph. aureus	free
19	Friedlander's bac.	heavy
20	*Hæmolytic strep.*	moderate

What is surprising is the frequency of the hæmolytic streptococcus, which one would imagine would be easily destroyed. There was also a fairly frequent appearance of intestinal organisms (*Bact. coli*, *B. proteus*, &c.), and one cup gave a heavy growth of Friedlander's bacillus. The other common organism was the *Staph. aureus*. Nearly all the organisms found were such as are commonly associated with stomatitis, and with mouth and gum complaints generally.

A cracked cup, then, may be a source of danger when some infected person has previously used it. The presence of Friedlander's bacillus is also an indication that respiratory organisms may be a source of infection and it is a reasonable assumption that the Klebs-Loeffler bacillus may be found if the cups have been used by a carrier. The presence of hæmolytic streptococci is also a reminder that a cracked cup may be an agent in the spread of scarlet fever. Syphilitic infection is unlikely but not impossible, and in the same category falls tuberculosis. These organisms, particularly the former, would be difficult to discover from cracks, but the fact that even relatively easily killed organisms can be found alive in such sites suggests that their transmission is not impossible. The most obvious danger of cracked and chipped crockery is however that of ulcerative stomatitis.

The usual excuse offered for the use of cracked cups is shortage of crockery, but if the public health is to be cared for such a consideration should have no weight, and legislation should be pressed to forbid the use of faulty vessels.

London, W1. SYDNEY LINFOOT.

INGUINAL HERNIA

SIR,—In Lieut.-Colonel Brandon's interesting article of Feb. 10 there is a remark at the end of phase 2 which reads "and one that may yet save the merchant seaman from becoming a sort of animated ironclad." There is no further indication as to what special operative procedure this refers.

I know that when I was a house-surgeon at the Dreadnought Seamen's Hospital at Greenwich 20 years ago a silver filigree was often used in the repair of herniæ, and is still so used. In the last 19 years at sea as a ship's surgeon I have seen many of these cases afterwards, frequently for some years, and in my small experience the operation has been quite successful.

It would be a pity if a pithy and telling phrase was allowed to discredit what has, in good hands, proved a very satisfactory procedure.

H. M. ROYDS JONES,
Surgeon, Orient Steam Navigation Co.

A CHAIR OF PSYCHIATRY

SIR,—The letter from "Service Psychiatrist" in your last issue has evidently been written without knowledge of the full facts.

The Goodenough Committee recommended that the London County Council's plans for the development of the teaching of psychiatry should be implemented "at the earliest possible moment." The filling of the vacant chair is the keynote of this development. There is nothing sacrosanct, however, about Sept. 1 as the date on which the successful applicant should take up the post. It was regarded, for the purpose of an estimate of the cost, as the earliest date by which the position could be filled.

The advertisement for applicants will be issued by the university. All the points raised in the letter about Service applicants have been well in mind. The university will be recommended to ensure that at least three months should be allowed between the issue of the advertisement and the receipt of applications. Advice will be taken from the Service departments as to whether three months is adequate. The directors-general of the Services will be asked to circulate information as to the vacancy through Service channels. There is no doubt that if a serving officer, who could not be released, were selected, there would be no difficulty in deferring the date of his taking up the appointment until he was free.

The sentence "Your announcement suggests that the LCC is prepared to pay him provided that the University of London accepts their nominee" seems to have been written in a complete misunderstanding of how these university appointments are filled. The university appointment is made by the senate on the recommendation of a university committee. The committee comprise a few LCC representatives, three expert assessors appointed by the university, together with the vice-chancellor (in the chair) and the principal of the university. Their nomination is submitted concurrently to the university and to the LCC.

J. W. BOWEN,
Chairman, Mental Hospitals Committee, London County Council.

County Hall, London,
SE1.

SIR,—May I support the protest by Service Psychiatrist in your last issue? Three years as consultant to a Force overseas have impressed upon me the really vital importance of doing nothing at home that will distract or distress the thousands of Service doctors, many of the highest qualifications and skill, whose task for a long time to come will be that of healing and assuaging the sickness and wounds of our fighting men on the land, at sea, and in the air. Every sympathy is felt for those hospital and teaching bodies who have vacancies on their staffs which they are anxious to fill, and who are perhaps suffering from the makeshift arrangements rendered necessary by a long and arduous war; but it is urged most earnestly upon all bodies with medical appointments to fill that such appointments should remain vacant until the end of the war so that doctors who may have been overseas for years may share with those who have spent the war at home at any rate the right to compete for positions for which many of them are eminently suited.

If our Service doctors are to go to fresh adventures in the Far East looking anxiously over their shoulders at the doings of their brethren at home (who have already enjoyed many advantages in addition to their uninterrupted domestic felicity) the result will be a bitter cleavage in our profession which may take many years to heal.

G. W. B. JAMES,
Brigadier; late consultant in psychiatry to the Middle East Force.

London, SW1.

SIR,—Surely a decision to make any appointment depends not only on the prospect of suitable available candidates but also on the need for filling the vacancy? A decision to call for applicants scarcely need take account of the former issue. The importance which Service Psychiatrist seems to attach to this chair would seem to argue against its being left vacant until Japan is defeated. Further, there is still ample time for any overseas psychiatrist to apply for this post. Should one of these be appointed, I hope one may reasonably anticipate that the Army authorities would see fit to release him for such an important post, and thereby give one like myself the opportunity to "see the world" in his place.

CIVILIAN PSYCHIATRIST
(not aspiring to the chair).

ŒSTROGENS IN CANCER

SIR,—The Royal Society of Medicine has arranged for a scientific committee, composed of the following fellows of the society, to investigate the effects of œstrogens in cancer:

Chairman: Prof. E. C. Dodds.
Vice-chairman: Dr. Alexander Haddow.
Hon. secretary: Dr. Frank Ellis.
Sectional representatives:
  Experimental medicine and therapeutics: Mr. A. L. Bacharach and Dr. K. M. A. Perry.
  Obstetrics and gynæcology: Mr. Malcolm Donaldson and Mr James Wyatt.
  Pathology: Dr. W. E. Gye and Dr. R. W. Scarff.
  Radiology: Dr. Ralston Paterson and Prof. B W. Windeyer.
  Surgery: Mr. Rupert Corbett.
  Urology: Mr. F. McG. Loughnane and Mr. Clifford Morson
Coöpted: Mr. G. F. Stebbing and Dr. A. B. Bratton.
Dr. K. M. Mather was *coöpted* as statistical adviser.

The advisability of forming such a committee was considered by the council of the society after a preliminary investigation by the radiological section at 15 radiotherapeutic centres of the effects of stilbœstrol in more than 100 cases of cancer of the breast (see *Proc. R. Soc. Med.* 1944, **37**, 731). At its first meeting the committee decided to concentrate attention on carcinoma of the prostate, breast, and œsophagus, to confine the investigation to dienœstrol at two prescribed dosage levels, and to ask that records be kept on forms based on those of the National Radium Commission, approved for use in the Ministry of Health's scheme for cancer. It was further decided that to avoid statistical difficulties the decision regarding the dose of drug to be used should be by random selection.

This letter is written on behalf of the committee so as to provide an opportunity for members of hospital staffs who might wish to coöperate in this investigation to communicate with the undersigned.

Royal Society of Medicine, Wimpole Street,
London, W1. F. ELLIS.

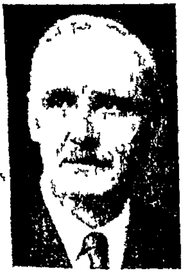
THE death is announced in New York of Dr. FRED H. ALBEE, consulting surgeon to the New York Hospital for Joint Diseases and a former president of the American Orthopedic Association. During the last war he used living bone grafts as internal splints, and the operations which bear his name make use of this technique. He was 68 years of age.

Obituary

WILLIAM THOMAS RITCHIE

OBE, MD, LLD EDIN, FRCPE, FRSE

Dr Ritchie, who died at his home in Edinburgh on Feb 7 at the age of 71, had retired in 1938 from the Edinburgh chair of medicine, in which he worthily maintained a great tradition He was president of the Royal College of Physicians of Edinburgh from 1935 to 1937



Swan Watson

Graduating in 1896 he spent some time in Vienna before returning to his own city He served in the last war, first as medical officer with the 1st/3rd Scottish Horse, and later in charge of the medical division of the 27th General Hospital in

was

and

ding

Dr. Lovell Gulland as professor in 1928 he devoted himself wholeheartedly to the promotion of teaching in the university and in the Royal Infirmary At the beginning of his tenure of office, considerable changes were made in the curriculum of the clinical years, particularly the third year, so as to correlate the instruction in medicine, surgery, pathology, bacteriology, and pharmacology When he came to the chair, the department of medicine consisted of little more than a lecture theatre and a professor, but he succeeded in securing premises and staff, and introduced demonstrations, lecture demonstrations, and tutorials He was constantly on the watch for material for his lectures and demonstrations at no time did his lectures stagnate, and he made good use of his gift for freehand drawing, both on the blackboard and on paper Besides being physician to the Royal Infirmary, he was physician and director of the medical unit of the Edinburgh municipal hospitals Soon after the outbreak of this war, he returned to the Royal Infirmary to take temporary charge of the wards of a colleague who was on military service, and he was also physician to the Emergency Medical Hospital at Bangour

Ritchie was the first to describe auricular flutter as a

published a monograph

h John Cowan in the

the Heart, and was joint

a Manual of Clinical

mostly on his favourite

subject he utterances included

the Gib in 1923 and the St

Cyres l

He acted at various times as external examiner in medicine at St Andrews, Durham, and Aberdeen The reputation he acquired of being a hard examiner—a reputation of which he was well aware—did not come of any conscious intention, but he set himself a very high standard both of competence and honesty and he expected the same from his students To all his university and hospital work he brought a single minded action which never flagged, and private practice was always made to take a place second to his primary duties

n he retired from his

years of his juniors, being always approachable and willing to give his valuable advice Though at times he was a difficult man to work with in committee this was because of his desire to do what he felt to be best for his university and hospital If he had a problem to tackle, he had to master it in finest detail and having done so he pursued his chosen course with thoroughness

His university last year conferred on him the honorary degree of LL.D, and it gave him much satisfaction that at the same ceremony his elder son graduated as MB His widow survives him with two sons and two daughters

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Notes and News

MEDICAL WAR RELIEF FUND

During the year 1943–44 the Medical War Relief Fund, under the chairmanship of Dr H Guy Dain, gave financial assistance to 35 applicants—9 more than in the previous year Gifts amounted to £4700, and loans to £1200 The total number of beneficiaries—some of whom have received more than one award—is now 113, Substantial assistance has again been obtained for applicants from other benevolent funds, such as the Lord Mayor's National Air Raid Distress Fund, the Officers' Association, and especially the Royal Medical Benevolent Fund, and

war service grants For the

of the Fund, distributions

in former years the Fund was well supported by doctors overseas—the total sum contributed through the Canadian Medical Association, for instance, now exceeds £2500 A subcommittee of the Fund provides medical books for British doctors who are prisoners of war, in coöperation with the Educational Books Section of the Red Cross and St John organisation, which arranges their dispatch This arrangement has two important advantages First, the parcels sent bear the Red Cross label, which receives priority, so the books arrive sooner than they would if sent by a bookseller Secondly, the EBS keeps a stock of medical books at Geneva and the time taken in transit is greatly shortened when a request from a prisoner of war can be met from this "Geneva reserve" During the year, 112 books were dispatched to 25 different camps and hospitals, the cost being £150 Only sums specially marked by subscribers are used for the purchase of books

Examples of the cases helped by the Fund are as follows

Dr G had

practice whic

had seriously

Subscriptions should be sent to the hon treasurer at BMA House, Tavistock Square London, WC1

REABLING THE DEAF

The three American army centres for deafened soldiers,

y question

ylvania, at

at Bordon

of deafness

has joined

the Army and these men together with those who have incurred their deafness during service are referred to the centres The hospitals keep a stock of deaf aids which are scientifically prescribed and the soldier is able to find by experience exactly which suits him best The fitted earpieces, to which the aid is attached are now to be manufactured there from clear acrylic resin or lucite Instruction is also given to the patients in lip reading and speech correction

A LIBRARIANS' JOURNAL

The Association of Special Libraries and Information Bureaux has received a licence for the publication of the *Journal of Documentation* and the first number of this new quarterly is to appear shortly under the editorship of Mr Theodore Besterman The journal

articles

and the

especially

of works dealing in a general way with the humanities and sciences The address of the publishers is 2 Bloomsbury Street, London

University of Cambridge

On Feb. 10 the following degrees were conferred:

MD.—R. I. N. Greaves.

MB, B Chir.—* C. D. Drew, * H. H. E. Batten, * D. W. R. Lyle, * I. A. Magnus, * T. J. S. Patterson, * A. N. Pearson.

* By proxy.

Medico-Legal Society

On Thursday, Feb. 22, at 5 PM, at 26, Portland Place, London, W1, Dr. Kenneth McFadyean will speak on the need for reform in statutes affecting illegitimacy.

Society of Public Analysts and other Analytical Chemists

At 3.15 PM. on Friday, March 9, at the Chemical Society's rooms, Burlington House, Piccadilly, London, W1, Mr. S. Ernest Melling, FRIC, will deliver his presidential address embodying observations on water and water-supplies.

Medical Superintendents Society

A meeting of the council will open at the Queen's (LMS) Hotel, Birmingham, on Saturday, March 3, at 10 AM.

Institute of Hospital Almoners

Sir William Beveridge, MP, will speak at the annual meeting of the institute which is being held at Caxton Hall, Westminster, on Friday, March 9, at 5.30 PM.

Medical Films

The following films will be shown by the Scientific Film Association at 1, Wimpole Street, London, W1, on Wednesday, Feb. 28, at 5.30 PM, and again at 8 PM: *Mass Radiography, The Larynx, Liver Fluke, Accident Service.* Tickets from the secretary of the medical committee, Dr. S. J. Reynolds, 14, Hopton Road, London, SW16.

Royal Sanitary Institute

At a meeting to be held at the public library, Cheshunt, on Friday, March 2, at 3 PM, Dr. Brian Russell will speak on post-war housing requirements.

The meeting, which was to have been held at Liverpool today, Feb. 24, has been postponed.

Refresher Course on Tuberculosis

The Joint Tuberculosis Council and the National Association for the Prevention of Tuberculosis, by arrangement with Manchester corporation, are holding a refresher course for tuberculosis officers and other doctors at Manchester University from Monday to Thursday, April 23 to 26. The lecturers will be Dr. D. P. Sutherland, Mr. A. Graham Bryce, Mr. J. B. Macalpine, Mr. V. F. Lambert, Dr. J. H. Harley Williams, Dr. H. G. Trayer, Dr. C. Metcalfe Brown, Dr. George Jessel, Dr. Peter Edwards, Prof. E. D. Telford, Dr. G. Lissant Cox, and Dr. Osborne Hughes. Further information from Dr. Harley Williams, Tavistock House North, Tavistock Square, London, WC1.

Royal Society of Medicine

On Monday, Feb. 26, at 4.30 PM, at the section of odontology, Mr. Rainsford Mowlem will read a paper on osteomyelitis of the mandible; Mr. Nils Eckhoff will also speak. On Feb. 27, at 4.30 PM, at the section of medicine, Colonel V. P. Sydenstricker, UNRRA, Prof. R. B. Hayes, and Wing-Commander McCreary, RCAF, will open a discussion on the clinical recognition of vitamin deficiency. At the section of neurology, on March 1, at 4.30 PM, there will be a discussion on acute meningitis, when the speakers are to be Dr. Maurice Mitman, Dr. E. S. Duthie, and Dr. Honor Smith. On March 2, at 10.30 AM, at the section of otology, Major Frank Lathrop, MC AUS, will speak on the repair of lesions of the facial nerve, and Mr. J. Malcolm Farquharson on the masking effect of sulphonamides in the treatment of acute otitis media. At 2.30 PM on the same day Lieut.-Colonel Ralph Tovell will present a 16-mm. sound-projection apparatus to the section of anæsthetics on behalf of the American Society of Anæsthetists. Afterwards papers will be read by Air Commodore R. R. Macintosh and Dr. W. W. Mushin. At the section of laryngology at the same hour Mr. F. C. W. Capps, Mr. E. Gwynne Evans, Mr. Arnold Nove, and Miss Van Thal will open a discussion on an upper-respiratory clinic for children.

The fact that goods made of raw materials in short supply owing [illegible] conditions [illegible] indication [illegible]

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED FEB. 10

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1466; whooping-cough, 1518; diphtheria, 402; [illegible] oid, 6; measles (excluding rubella), [illegible] (primary or influenzal), 1119; puerperal pyrexia, 133; cerebrospinal fever, 94; poliomyelitis, 5; polio-encephalitis, 0; encephalitis lethargica, 1; dysentery, 324; ophthalmia neonatorum, 63. No case of cholera, plague, or typhus fever was notified during the week.

T[illegible] civilian sick in the Infectious Hospitals [illegible] cil on Feb. 17 was 1083. During the [illegible] ases were admitted: scarlet fever, 49, [illegible]; whooping-cough, 24.

Deaths.—In 126 great towns there were no deaths from enteric fever, 2 (0) from scarlet fever, 14 (0) from measles, 14 (1) from whooping-cough, 5 (0) from diphtheria, 56 (6) from diarrhœa and enteritis under two years, and 67 (13) from influenza. The figures in parentheses are those for London itself.

Leeds and Birmingham each reported 7 deaths from diarrhœa. There were 3 fatal cases of whooping-cough at Liverpool.

The number of stillbirths notified during the week was 218 [illegible] a rate of 30 per thousand total birth [illegible] London.

Appointments

[illegible] LEEDS: registrar to the ear, nose, throat [illegible] partments of Chester Royal Infirmary.

[illegible] FRCSE: first asst., accident dept., Radcliffe Infirmary, Oxford.

MCCORMICK, I. S., MB GLASG.: asst. TO for Fife.

MANIFOLD, J. A., CB, DSO, M[illegible] medical superintendent [illegible]

PRICE, R. E. A., MB LOND.: [illegible] Aylesbury.

SMITH, MARY, MD LOND., DRCOG: asst. MOH for Wembley.

Births, Marriages, and Deaths

BIRTHS

BEDDARD.—On Feb. 13, at Windermere, the wife of Capt. F. D. Beddard, RAMC—a daughter.

BREACH.—On Feb. 15, at Orpington, the wife of Dr. Alan Breach—a son.

BURTON.—On Feb. 14, at Bristol, the wife of Lieutenant J. S. Burton, RAMC—a son.

EVANS.—On Feb. 14, at Sheffield, the wife of Dr. Sinclair Evans, of Bakewell—a son.

EVANS.—On Feb. 15, in London, the wife of Dr. W. G. Evans—a son.

GORDON.—On Feb. 12, at Liverpool, the wife of Prof. R. M. Gordon, FRCP—a son.

HOPE.—On Feb. 11, at Woking, the wife of Dr. Eustace Hope—a son.

JOBSON.—On Feb. 13, the wife of Major P. H. Jobson, RAMC—a daughter.

LATHAM.—On Feb. 18, at Sherborne, the wife of Surgeon-Lieut.-Commander W. J. Latham, RN—a son.

MCGAVIN.—On Feb. 9, at Leicester, the wife of Mr. Donald McGavin, FRCS—a son.

MACMANUS.—On Feb. 10, in London, the wife of Surgeon Lieutenant Niall MacManus, RNVR—a son.

SITA.—On Feb. 11, at Southport, the wife of Surgeon Lieutenant E. G. Sita, MRCP, RNVR—a son.

TOWN-JONES.—On Feb. 14, at Farnham, Surrey, the wife of Dr. E. M. Town-Jones—a daughter.

MARRIAGES

MANNING—WEBBER.—On Feb. 7, in London, Frederick Everard Beresford Manning, MD, lieut.-colonel IMS, to Elizabeth Robert Webber.

PATTISON—ANDREWS.—On Feb. 5, at Colombo, Peter Pattison, surgeon lieutenant RNVR, of Sheffield, to Mary Andrews, WRNS.

WILDY—KENION.—On Feb. 3, in London, Peter Leete Wildy, MRCS, of Wadhurst, Sussex, to Joan Kenion.

DEATHS

ANDERSON.—On Feb. 17, in London, Charles Macdonell Anderson, MD EDIN.

BOLTON.—On Jan. 26, at Durban, Frank Elliott Bolton, MRCS, surgeon captain RN retd.

CURL.—On Feb. 10, at Overstrand, Norfolk, Henley Frank Curl, BA CAMB., MRCS, recently of Wokingham, Berks.

GALBRAITH.—On Feb. 11, in London, Ernest Edward Scott Joseph Galbraith, LRCPE, DPH, formerly of York.

GRAHAM.—On Feb. 16, at Darlington, James Hernies Graham, MB DURH., major RAMC retd.

KELLY.—On Feb. 10, at Desford, Thomas William Gordon Kelly, MD DUBL.

STURDEE.—On Feb. 12, at Little Walsingham, Norfolk, Frederick Herbert Sturdee, FRCSI, aged 71.

THE VALUE OF WORK IN TREATMENT OF TUBERCULOSIS *

FREDERICK HEAF, MD CAMB., MRCP
SENIOR MEDICAL OFFICER, LCC PUBLIC HEALTH DEPT.

THE use of work as a therapeutic measure in the treatment of tuberculosis begins with Marcus Paterson's bold and enterprising methods at Frimley during the years 1910–16. Prior to this day gentle exercises had been prescribed, but the attitude of physicians in general was to forbid any form of labour to the tuberculous, particularly movements involving the muscles of the thorax and upper extremities. That period I would call the pre-Patersonian era, when work was taboo and the mild exercises prescribed by the less cautious physicians were quite arbitrary and unrelated to clinical observations on the patient's condition.

UNPRODUCTIVE AND PRODUCTIVE WORK

Paterson brought order out of chaos by instituting a rigid system of rest and graduated exercises, controlled by careful recordings of the patient's temperature, pulse-rate, and opsonic index. His theory of auto-inoculation may not have been correct, but it was a foundation on which he could build a controlled form of treatment which took the patient with reasonable safety from absolute rest in bed through all the grades to heavy work. Unfortunately, the discipline imposed on both physician and patient for the successful application of the strict routine of this treatment, combined with the lack of variation of the exercises, induced boredom and depression in many patients which often gave way to irresponsible behaviour on discharge from the sanatorium. The regimentation of patients to accurately graded but monotonous labour, often of a simple and almost childish character, did not stimulate that confidence and hope of return to remunerative employment which we now know is essential if the patient's full cooperation is to be gained in our efforts on his behalf. Moreover, the long years of military discipline endured by many patients during 1914–19 created a strong aversion to the clockwork regularity of the Patersonian routine and it was not easy to persuade them that the discipline of the treatment was essential for their successful recovery from the disease.

At Papworth, Sir Pendrill Varrier-Jones, visualising the psychological value of productive employment as a stimulus to work, disregarded the scientific basis of Paterson's treatment and began to give patients industrial work which eventually had an economic value that could offer a means of livelihood under the ideal environment of a village settlement. In doing this he created for the patient a vista of hope by repressing the invalid complex and encouraging the man's confidence in himself as a worker. The monotony of the [illegible] exercises was replaced by the [illegible] ected [illegible], and [illegible] assessment of working [illegible] trial and error than on [illegible] and laboratory investigation.

The remarkable growth of the industries at Papworth gave Sir Pendrill an ever-widening opportunity to cater for the employment of the great variety of patients attracted by the prospect of security and permanent employment within the [illegible] At one stage it seemed [illegible] overshadow the primary [illegible] of course, the cure of tuberculosis. Happily that danger has been averted by concentrating on the individual requirements and treatment of each employee as a medical case requiring continuous care and observation, even though his work may have a high economic value.

Concurrently with the decline of Patersonian methods [illegible] use of graduated exercises as a means of treatment and has completely shattered the auto-inoculation theory. It has however encouraged physicians to focus their main attention on the pulmonary lesion and has lessened their consideration of the man [illegible] otlight the lesion, [illegible] general reactions into the surrounding darkness.

DIVERSIONAL THERAPY AND REST

It is not surprising, therefore, that some medical [illegible] ed with Paterson's [illegible] regular sanatorium [illegible] have relied almost entirely on collapse and chemotherapy to produce results. Others, seeing the obvious advantages of relieving the enforced idleness of patients by work, and remembering the old proverb that Satan finds mischief for idle hands to do, have grasped at the shadow of Papworth and instituted handicrafts. So long as these efforts at keeping the patient occupied are regarded as diversional therapy, all is well, but such employment must not be confused with the real productive occupational therapy of an industrial settlement or the strict graduated exercise therapy which Paterson developed at Frimley.

Diversional therapy has a psychological value in relieving the introspective boredom which encourages disobedience and is so often present in sanatoria where no work of any kind [illegible] controlled and an encouragement grant of from 5*s.* to 10*s.* per week paid to those who make saleable goods. If this is not done [illegible] zeal to amass a [illegible] progress. Just [illegible] therapy needs [illegible] side must conf [illegible] over-exertion [illegible] to [illegible] on rehabilitation.

[illegible] am often distressed to see how truly some sanatoria have become what Paterson called "homes for tuberculosis." Discipline is at a discount, and, except for meal times, the patients are left to their own resources as regards occupation and amusement. A pretence at graduated exercises is made by a weekly instruction to do one, two, or four miles, or maybe to walk to the nearest cross-roads, maybe passing the local pub on the way; but little or no attempt is made to find out if the prescription is being carried out conscientiously. Handicrafts may be encouraged, but the patient too often buys his own material and conducts his own business even to the exploitation of his fellow patients. All this is thoroughly bad and has no therapeutic value whatsoever.

Rest hours, too, are often times for political arguments or incubation periods for the hatching of complaints. The importance of controlled rest as an adjunct to work therapy has long been appreciated in sanatorium practice, but there has been too little attention paid to instructing patients how to obtain the full benefit from the rest period. The art of relaxation is one which few patients acquire without tuition, and I suggest that the full value of mental and muscular relaxation has not been [illegible] explored in the treatment of tuberculosis. It is [illegible] awaiting the attention of the physiotherapist, [illegible] majority of us could do a great deal more [illegible] institution to increase the beneficial [illegible] hours to which so much lip service has [illegible] past.

With the pioneer work of Paterson [illegible] McDougall before us, and the [illegible] under memorandum 297T and [illegible] Employment Act, the [illegible] tion scheme to run [illegible] treatment awaits our immediate [illegible].

[illegible]

H. A. Patt[illegible] Memorial Institute [illegible] written: "The most important requisite [illegible] recovery from tuberculosis is a good, [illegible]

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* Address to the Tuberculosis Association on Nov. 17, 1944.

NITROGEN LOSS AFTER THERMAL BURNS

EFFECTS OF ADDING PROTEIN AND METHIONINE TO DIET OF RATS

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OUR object was to determine whether the feeding of high-protein diets to animals would diminish the tissue wastage and loss of nitrogen (N) in the urine following burns, and whether a single amino-acid or a mixture of a few essential amino-acids could replace the total protein.

Influence of Increased Protein Intake

It has long been known that injury produces a metabolic disturbance with losses of N in the urine: in a series of papers from 1930 onwards Cuthbertson and colleagues have reported investigations on man and animals suffering from injury due to fracture and tissue laceration (reviewed by Cuthbertson 1942a). From work on fracture cases (Cuthbertson 1936) it was concluded that " diets rich in first-class protein, and containing the maximum of calories which the patient could consume failed to eliminate the negative nitrogen balance at the height of the katabolic process in many cases of fracture due to direct violence." With less tissue damage the effect of increased protein intake was more favourable.

Turning to the special problem of burns, Lucido (1940) in one patient observed a high output of urinary N (as well as azotæmia), and Black in 1941 drew our attention to this phenomenon in one of his patients. In animals, Clark, Peters, and Rossiter (1943) showed that, on a diet containing 10% casein and 10% dry yeast as a source of protein, rats lost weight and developed a negative N balance after a burn; and this negative balance continued after the period of hæmoconcentration was ended. They demonstrated also a sharp rise in blood non-protein nitrogen (NPN), a slight fall in the total plasma protein and a marked fall in the plasma albumin, giving a decrease in the albumin/globulin ratio. There was a tendency towards increase of N loss with increase in the temperature of the burn. The condition produced in these animals formed the starting-point for an investigation of the effect upon these N losses of increasing the dietary protein. In patients recently, Taylor, Levenson, Davidson, Browder, and Lund (1943) confirmed the large N deficits after burns, and produced evidence that large amounts of protein, up to about 290 g. per diem, would correct this loss. Anderson and Semeonoff (1944) have also found extensive N losses in the urine of severely burned patients.

METHODS

White rats weighing 100–150 g. were used. Substantially, the technique of Clark et al. (1944) was employed for the metabolic work.

Feeding.—The diets were:

—	Basal diet	Increased-protein diet
Wheat starch	70	70
Casein	10	20
Dry yeast	10	10
Salt mixture	5	5
Agar-agar	2	2
Cod-liver oil..	3	3
—	100	110
Water (approximately) ..	60	65

Enough water was added to make into a consistent dough, the amounts given above being approximate. Vitamin B_1 concentrate 28 mg. (containing 0·2 mg. aneurin) was added to every 70 g. of wheat starch. This addition of vitamin B_1 was necessary because estimations kindly made by the late Mr. H. W. Kinnersley in this department showed that the aneurin content of the yeast used was low (300 µg per 100 g.). For convenience in making up the diet, the basal mixture containing 70% starch was supplemented by the extra casein, and the changes so induced in the proportions of the remaining constituents neglected: these are actually very small.

As Cuthbertson, McGirr, and Robertson (1939) found, the ingestion of a known amount of food each day must be ensured. Unless otherwise stated, the rats were given 15 g per diem of the dough for a preliminary period of approximately 10 days, until sufficiently steady conditions wer reached. If more food or longer periods were required t reach a balance, additions up to an extra 5 g. were given an the time sometimes extended to 3 weeks. Unlimited drinkin water was given.

The rats were withdrawn from the metabolism cages fo two periods daily—10 AM to 12 noon and 3.30 to 4.30 PM— and fed in glass bowls. The urine was collected in decinorma sulphuric acid for the remaining 21 hours per diem, using modification of Hopkins's method for separation of the urin and fæces. Elimination of all food from the metabolis cages avoided contamination of the urine samples; furthe no loss of food could occur through the wide-meshed floor o the cages.

After the first two or three days the animals ate their foo completely. During the first 24 hours following the burn conditions were disturbed and up to 5 g. was apt to be lef unconsumed. The slight loss of urine during the 3-hou feeding periods has been thought less objectionable than error induced by feeding the rats in their cages.

Burning.—Rats were anæsthetised with ether and burne by immersion of the back (approximately one-third of th body surface) in hot water at 73° C for 30 sec. The hair wa not clipped. A few experiments were done at 75° C but th temperature was reduced because of the heavy mortality-rate With burns at 73° C the loss of animals was less than 1% Controls were similarly anæsthetised but not burned. Thes burns led to destruction of the dermis and epidermis; a har scab quickly formed with almost no oozing in most experiments. Occasionally areas of the scab became detached possibly by scratching, but this did not appear to upset th experiment. In two animals kindly examined by Mr. R. I Vollum, D PHIL., no bacteria were found in the scabs an underlying tissue.

Estimation.—Nitrogen estimations of urinary urea+ ammonia were determined by the method of Conway an O'Malley (1942) and of creatine and creatinine by that o Folin (1913). Throughout the paper, unless otherwise stated "urinary N" *means* "*urinary urea+ammonia N.*" Each day's urine plus the washings of cage and funnel was mad up to 100 c.cm. with decinormal acid and filtered. This wa diluted 1 in 10, and 0·2 c.cm. taken for N analysis.

When required for analysis the fæces were stored in acidifie alcohol (Mitchell 1923) separately for the preliminary perio and for 9 days after burning; the grouped fæces were ashe and total N determined by micro-Kjeldahl.

RESULTS

In a preliminary group burned at 75° C, six animal on the basal diet showed urinary losses averagin 300 mg. urea+ammonia N in the 10 days following th burn, as compared with the mean daily output in th 4 days preceding the burn. This confirmed the previou observations in this department of Clark et al. (1944) Compared with these, five rats maintained from th start on the raised protein diet (18% casein) showed corresponding loss of 90 mg. N. Some observation upon the excretion of creatine in these rats are recorde in Appendix I.

These results, though not statistically significant, sug gested that a high-protein diet was beneficial: th experiments on the basal diet were then repeated on a group of seven animals burned at 73° C; again a loss o N occurred. This led to the final planned curativ experiments, which will be reported in full.

In these the animals were paired, one of each pai being ultimately burned and the other kept as a control each pair of animals was selected to have approximatel the same weight and excretion of N on the basal diet Four pairs of rats were used at one time; later six making twelve metabolism cages in use at one time. A the start all the animals were on the basal diet; afte the 4-day period during which urinary estimations wer made to ensure a sufficiently steady excretion, th animals were anæsthetised, and one member of each pai burned. From this time the animals were placed upo the experimental diet, either the raised protein or a continuation of the basal diet.

The individual values for the daily excretion of urinary N for eight pairs of animals on the basal diet ar

TABLE I—DAILY URINARY UREA+NH_3 NITROGEN EXCRETION (MG. N PER 24 HRS.) OF RATS ON THE BASAL DIET

Rat	Days 0	1	2	3	4	5	6	7	8	9	10	11	12	13
Control animals														
*DF	141	142	126	141	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*DG	116	137	124	114	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*DR	143	130	134	112	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*EB	151	123	121	93	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
EE	150	122	120	101	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
FO	183	169	178	146	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ES	152	142	115	101	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
EV	154	156	150	150	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mean	149	140	134	120	121	135	130	136	141	146	136	141	147	153
Animals burned on day 3 at 73° C for 30 sec.														
*DI	151	132	140	137	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*DJ	159	131	150	113	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*DX	148	152	145	127	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*DU	127	92	128	135	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
EG	175	158	159	139	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
FN	102	102	126	133	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
FR	118	118	116	96	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ER	127	123	112	130	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mean	138	126	135	126	160	160	187	177	185	187	177	174	166	160

* 20 g. food per diem

DR, DX, and DU males, all the rest females

shown in table I. Similar values for a curative experiment on seven pairs of rats with the increased protein diet are given in table II. The mean values of the daily N excretion and weights of the animals are plotted in fig. 1 and the mean cumulative N excretion for the burned and control groups on the two diets in fig. 2.

[illegible] values for [illegible] have been excluded because the animals were still on the basal diet during the first day, and because the portion of the daily ration left for the afternoon feed was incompletely consumed after the burn, making excretion values unreliable.

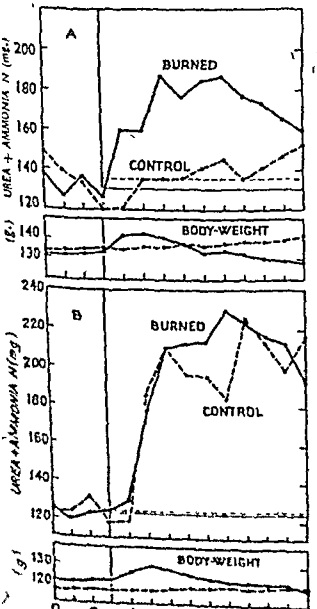

Fig. 1—Mean daily urinary nitrogen (urea+NH_3) excretion, and body-weight curves. Burns at 73° C for 30 sec. A = basal mixture + 10% casein. B = basal mixture + 18·2% casein.

On the basal diet the mean total loss in the 9 days is 301 ±107 mg. N for the burned animals, as compared with a mean loss of 91 ±192 mg. N on the raised protein diet. Comparing the means for the excretion of the control and burned animals from days 5–11 inclusive, using Fisher's formula (1941), the differences in the means are highly significant for the rats on basal diet, there being less than a 1 in 100 possibility that they could arise by chance selection ($P<0·01$). On the raised-protein diet, however, the differences are not significant ($P=0·4–0·3$). Hence there is proof that in these animals raising the dietary protein is beneficial.

TABLE II—DAILY URINARY (UREA+NH_3) EXCRETIONS (MG. N PER 24 HRS.)

Rats on basal diet for days 0–3 inclusive, and then both control and burned animals placed on raised-protein diet from day 4 onwards

Rat	Days 0	1	2	3	4	5	6	7	8	9	10	11	12	13
Control animals														
Mean	124	123	132	119	120	185	210	197	196	184	226	213	199	216
Animals burned on day 3 at 73° C for 30 sec.														
CF	114	133	147	130	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CG	117	105	116	136	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CK	131	128	132	129	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CI	141	124	134	106	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CL	103	95	120	108	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CQ	111	135	95	127	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CR	125	127	125	129	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mean	125	121	124	125	130	178	210	212	213	229	223	216	213	192

All female rats.

DISCUSSION

Th[illegible] ys after burning. pr[illegible] he diet of higher [illegible] N loss on a diet of 11% yeast as the sole source of protein. In one set of experiments not reported in full, a group of six animals which were burned at 75° C while maintained on the casein-free diet showed a mean loss of 130 mg. N in 10 days. This reinforces the argument about the value of more protein. In our basal diet, including 10% casein, the yeast supplied about 4% of good-quality protein; so that the total protein content was about 11% (by analysis the N content was 2·32% of the dry mixture).

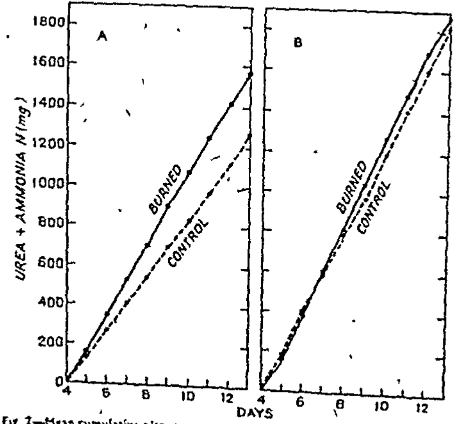

Fig. 2—Mean cumulative nitrogen excretion, following burns at 73° C for 30 sec. A = basal mixture + 10% casein. B = basal mixture + 18·2% casein.

In man, a diet in which 11% of the calories consist of protein of good biological value might be considered a good diet for the adolescent. It is, however, difficult to arrive at a direct comparison between the protein requirements of the rat and of man, owing to the great differences in rate of growth and of metabolism.

McCollum and Davis (1915) found that the lowest plane of protein intake for maintenance of the growing rat is 3% milk protein, and that a progressive increase in the rate of growth is induced by increasing the dietary protein from 3% to 8%. Osborne, Mendel, and Ferry (1919) got "normal growth in rats" with a 12% casein diet, and Mitchell (1923) showed good growth with 10% casein. More recently Hamilton (1939) found that the minimal percentage of whole-egg protein capable of giving maximum growth in rats lies between 12 and 16, noting that young rats of less than 125 g. which are growing very fast probably need 20% protein if the growth-rate is to be maximal. Hamilton also found no appreciable change in the growth-promoting value of diets containing up to 42% protein as against 16% protein, while at even higher protein contents up to 54%, the growth-promoting value definitely decreased.

Though we realise that much nutritional work in the rat has been done with diets containing approximately 20% casein, this is above the amount necessary for rats of the weights used in these experiments. It seems safe to assume that a diet of approximately 14% protein content should be substantially adequate for maintenance. Thus 22% would be an amount above ordinary requirements, and probably the equivalent of a rather high protein intake in man.

There is no reason to believe that the method of divided feeding complicates our interpretations. Mitchell (1923) investigated divided feeding and found that on a raised-protein diet the utilisation of protein was slightly greater with three feeds a day than when the protein was given in a single daily feed. Our method of feeding twice daily should be more satisfactory than a single daily feed, and we think that it forms the most satisfactory experimental compromise.

Our observations of the high mortality-rate produced by burning at 75° C, as compared with burning at 73° C, lend further emphasis to the work of Leach, Peters, and Rossiter (1943), who showed that quite small changes in the temperature at which a burn is made may have very profound consequences for the animal.

In regard to the total N balance, there is no significant local oozing from the scabs; estimations of fæcal nitrogen have not been done in these experiments. At this stage of the investigation nothing less than daily fæcal estimations upon all rats seemed likely to be of value, and this was impracticable. Nevertheless, it would be strange if variations in digestion and absorption by the burned rats could explain the differences produced by the extra 8% casein in the diet. Apart from the inherent improbability that such an exact balance could be produced on the raised-protein diet, it must be noted that the weight curves agree with the urinary changes, which could not happen if extra N was being lost in the fæces. Further, in the experiments to be described in the second part of this paper, estimations of fæcal N made it clear that, with methionine, variations in digestion and absorption cannot explain the results.

Clark et al. (1944) have already found that the non-urea N fraction in the urine after burning is less than 20% of the total N. In a single case at the height of the metabolic disturbance, it was confirmed that urea + ammonia N was 89% of the total urinary N.

In general, our results give striking experimental support to the indications from the work of Taylor et al. (1943) upon patients suffering from burns, and the more recent work of Co Tui, Wright, Mulholland, Barcham, and Breed (1944). It is firmly indicated that where possible high-protein feeding should be the rule in severe burns, and we think that our results justify the suggestion that other clinical conditions where there is a large loss of skin with its proteins should also receive a high-protein diet. It has been suggested already (Clark and Rossiter 1944) that extra carbohydrate should also be of value in the early stages of treatment.

The Influence of Methionine

One possible hypothesis to explain the benefit of increased protein intake is that the loss of N in the urine is due to the raiding of the tissue protein for one or two amino-acids particularly needed for formation of new skin protein, and the elimination of the N from the [illegible] amino-acids of the tissue-protein molecule through the kidneys as urea. This led us to examine the effect of the sulphur-containing essential amino-acid methionine, and also of an *amino-acid mixture*, and of alanine and cysteine.

METHODS FOR THE AMINO-ACIDS

The details of the feeding and of the estimations were as in the previous experiments. Intimate mixing of these amino-acids with the rest of the diet was ensured by grinding the amino-acids and casein carefully in a mortar before adding them.

The diets supplemented by the amino-acid mixture was as follows: To 100 g. of the basal diet, the following were added: *dl*-leucine 0·485 g., *dl*-isoleucine 0·485 g., *dl*-phenylalanine 0·39 g., *dl*-threonine 0·37 g., *dl*-methionine 0·35 g., *dl*-lysine 0·625 g. (as lysine dihydrochloride), *dl* valine 0·79 g. The total addition was 3·81 g. This mixture was based to some extent upon the amino-acids available and upon the amount of these acids in the extra 10 g. casein added in the previous raised-protein diet.

Amino-acids.—The following were commercial specimens (Merck, USA): *dl*-leucine, *dl*-isoleucine, *dl*-threonine, *dl*-valine; they were accepted as supplied. We are much indebted to the Ministry of Supply for synthetic *dl* methionine (analytical figures: N 9·3%, S 21·4%, KCl 1·0%), *dl*-phenylalanine (N 8·44%, MP 170°), and *dl*-lysine (as dihydrochloride) (N 13·0%, Cl 32·1%).

In testing the urines for methionine, the colorimetric test of McCarthy and Sullivan (1941) was used.

RESULTS

In a few preliminary experiments, in which rats were burned at 75° C, there were indications that maintaining rats on a basal diet supplemented by 2% methionine had a beneficial effect similar to that produced by an increased protein intake. Controlled maintenance experiments were then done, burning the animals at 73° C. Rats were maintained upon the following three diets for the whole period, including the preliminary period preceding urinary observations: (*a*) the basal diet, containing 10% casein and 10% yeast; (*b*) the basal diet + 2% methionine; and (*c*) the basal diet + 1·2% alanine equivalent in α amino N to 2% methionine. These experiments were done successively and not simultaneously as in the later curative experiments. Table III gives the mean N excretion of these rats: amounts of N excreted in the urine in the period succeeding the burn in excess of the mean daily excretion in the preliminary period are given diagrammatically in fig. 3, including analyses for the day immediately following the burning. It will be seen that methionine reduced the N loss whereas alanine did not. This result was statistically significant.

TABLE III—MAINTENANCE EXPERIMENTS

Comparison of the nitrogen excretion after burning of rats on (*a*) the basal diet, (*b*) the basal diet + 2% methionine, and (*c*) the basal diet + 1·2% alanine.

A.—*Mean daily urinary urea and ammonia N excretion (mg. per 24 hrs.). Control period 4 days. Rats burned on day 3 at 73° C for 30 sec.*

Diet and no. of rats	Days 0	1	2	3	4	5	6	7	8	9	10	11	12	13
Basal (15)	119	117	118	114	153	147	156	161	164	160	150	154	154	15
Methionine (9)	128	139	134	135	143	154	143	148	147	140	146	144	141	131
Alanine (9)	124	129	123	138	158	156	146	146	166	171	166	162	168	161

B.—*Mean body-weights of the groups of rats in A*

	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Basal	140	140	141	140	147	147	145	140	139	138	135	134	133	132
Methionine	137	136	137	137	143	144	144	141	139	139	138	137	136	13
Alanine	136	136	136	136	141	144	142	139	136	136	133	132	130	12

Curative experiments.—These were controlled like the final experiments upon raised-protein diet, with a further improvement in the technique. The animals were grouped in pairs and placed upon the basal diet for the period preceding the burn; after anæsthetising and burning, or anæsthetising only, the animals were retained upon the basal diet or placed upon the basal diet supplemented with 1% methionine or the mixture of synthetic amino-acids as described above. Hence, at any time, four animals out of a group of twelve were on the basal diet, four on the methionine diet, and four upon the amino-acid mixture, while in each group of four, two rats were burned and two kept as controls.

The results of four successive experiments of this type are collected in table IV. Quite clearly the 1% methionine supplement has reduced the N loss almost completely. The curative effect of [illegible] mixture of synt[illegible] negligible. Pos[illegible] In fig. 4 we have [illegible] burning, when t[illegible] after the burn on the basal diet, the basal diet + extra protein and these two amino-acid supplements, showing the effects of these different diets on the N loss. It seems clear that only the 1% methionine diet reduced the N loss in a similar way to the raised-protein diet.

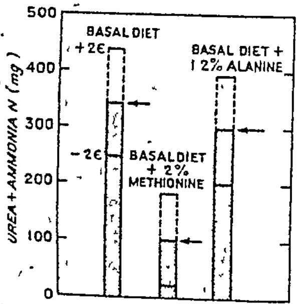

Fig. 3—Mean cumulative nitrogen loss (±2ε) in 10 days after burning. Effect of adding methionine and alanine to the diet.

Estimations upon fæces.—Values of the mean fæcal N excretion for the preliminary period and that following the burn are given in table V for rats upon basal diet, and on the 1% methionine and the amino-acid mixture supplements. It will be seen that there is no difference between the groups; hence, the benefit from the methionine is not due to "diversion" of N from urine to the fæces in the burned animals.

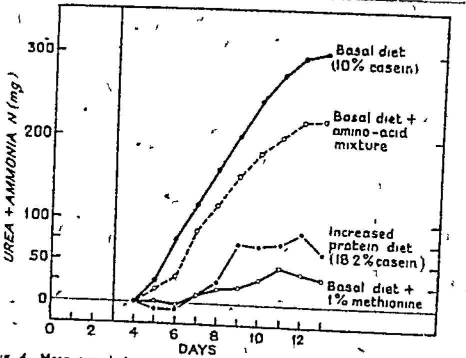

Fig. 4—Mean cumulative nitrogen loss on different diets following burns at 73° C for 30 sec.

Experiments with cysteine.—In view of the positive effect of the methionine [illegible] experiments [illegible] curative six pairs usi[illegible] cysteine; using 1% l-c[illegible] six pairs three of the [illegible] Of these, hours of the [illegible] within 48 [illegible] The averaged results for the remaining nine pairs of animals are given in table VI. They show that cysteine had no beneficial effect on the N loss.

TABLE IV—CURATIVE EXPERIMENTS

Effects of 1% methionine (A), and an amino-acid mixture (B) on the nitrogen excretion of rats following burns at 73° C for 30 sec. (C) Mean body-weights of these groups of animals.

A—*Daily urinary urea and ammonia nitrogen excretion (mg N per 24 hrs.); rats on the basal diet for days 0–3 inclusive, and then both control and burned animals placed on a diet supplemented by 1% methionine, from day 4 onwards*

Rat	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Control animals														
[illegible]	110	110	118	128	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	76	80	91	92	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	103	100	111	120	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	117	118	144	137	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*DL	133	137	151	115	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*[illegible]	129	112	149	151	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*[illegible]	128	141	158	139	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*DZ	156	151	170	132	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	164	138	152	133	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	132	137	123	158	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
FF	178	139	178	150	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
FQ	127	141	149	127	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mean	[illegible]	133	137	[illegible]	137	117	157	115	160	148	150	117	137	139
Animals burned on day 3 at 73° C for 30 sec.														
[illegible]	116	131	131	123	172	142	140	147	148	143	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	93	102	93	95	132	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	97	101	110	117	147	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	143	115	126	140	119	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*[illegible]	123	126	137	106	139	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*DK	149	125	139	105	120	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*[illegible]	135	120	140	123	170	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*[illegible]	134	142	145	141	159	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	120	[illegible]	121	109	123	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	121	136	139	160	161	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	131	102	115	122	170	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	141	149	161	156	221	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	140	146	122	98
Mean	130	123	131	126	133	148	152	[illegible]	168	150	160	182	130	172

* 21 g. food per diem
[illegible] DZ, and DF males, all the rest females

B.—*Daily urinary nitrogen excretion of [illegible] turned [illegible] ture.*

Rat	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Control animals														
*DM	137	108	114	127	104	120	140	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*DP	139	128	131	97	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*DT	110	127	109	108	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*DV	150	132	115	121	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
EJ	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
EN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mean	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Burned animals														
*DN	151	132	150	140	146	120	190	195	229	201	197	[illegible]	[illegible]	[illegible]
*DQ	143	101	153	180	151	124	198	233	198	196	[illegible]	[illegible]	[illegible]	[illegible]
*DW	91	99	145	121	113	102	185	205	201	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
*[illegible]	157	110	95	140	123	188	102	181	191	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
LK	124	148	143	132	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	135	120	170	126	151	158	129	214	221	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
FA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mean	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

* 20 g. food per diem
DM, DN, DP, DQ, DT, DV, and [illegible]

C.—*Mean body weights of [illegible]*

Rat	0	[illegible]
Control	[illegible]	[illegible]
Burned	[illegible]	[illegible]

In view of the abnormally large amounts of methionine being given to the rats, it was thought that an appreciable fraction of this amino-acid might escape fixation, and be eliminated by the kidneys. In a series of six urinary-estimations from rats upon both 1% and 2% methionine diets, there was not a measurable amount of methionine in the urine; it was estimated that less than 4 mg. per diem was excreted as such—i.e., not 4% of the methionine ingested. Similarly, on the cysteine supplement less than 2% of the cysteine was excreted in -S-S- form as judged by qualitative test.

TABLE V—MEAN DAILY FÆCAL N (MG. PER 21 HRS.) OF RATS ON VARIOUS DIETS

Mean daily fæcal N of rats during preliminary 4-day period (22 rats) .. .. 65 ±5·0 (±2ϵ)

Mean daily fæcal N in the 9-day period (days 5–13)

—	Controls (±2ϵ)	Burned (±2ϵ)
Basal diet	58 ± 9·3 (4 rats)	65 ±22 0 (2)
1 % methionine ..	56 ± 6·9 (4)	63 ± 9 7 (4)
Amino-acid mixture ..	72 ±18·7 (4)	59 ±10·0 (4)
Mean	62 ± 7·9 (12)	62 ± 6·3 (10)

TABLE VI—EFFECT OF 1% CYSTEINE SUPPLEMENT ON THE N LOSS FOLLOWING BURNS AT 73° C FOR 30 SEC.

Controls					Burned				
Rat	Basal N excretion in 4 days (mg. N)	Excretion in 9 days at basal rate	Excretion in days 5–13	Increase	Rat	Basal N excretion in 4 days (mg. N)	Excretion in 9 days at basal rate	Excretion in days 5–13	Increase
*JI	530	1195	1262	167	JX	499	1124	1350	226
*JR	643	1448	1554	106	*JT	552	1242	1988	746
*JS	729	1641	1783	142	*JU	564	1269	1734	465
JW	493	1108	1203	95	*JV	660	1485	1930	445
JY	549	1259	1211	−48	JZ	539	1214	1388	174
KA	433	980	1238	258	KB	478	1078	1407	329
LB	421	946	1116	170	LC	469	1054	1420	366
LH	405	910	1073	163	LG	385	865	1282	417
LI	523	1178	1177	−1	LL	408	918	1502	584

—	Controls	Burned
Mean increase in N excretion in days 5–13 in excess of basal excretion (±2ϵ) ..	117 ±62	417 ±119
Mean N loss by burned animals in days 5–13	300 ±133	

* 20 g. of food per diem.

Rats JI to KB all males and given 1 % *dl*-cysteine.
Rats LB to LL all females and given 1 % *l*-cysteine as ester hydrochloride.

Body-weights.—It will be seen that in both the maintenance and the curative experiments there are slight differences in the average losses in weight in the burned animals on the different diets. These are not, however, statistically significant, although they happen to correspond roughly with the extent of the N loss.

DISCUSSION

The synthetic methionine used was racemic; this is usually held to behave physiologically as the natural form (Rose 1938), though Bennett (1939) thought that the *dl*-form was "somewhat less readily used for growth than the *l*-form." The alanine was also racemic; since this is not an essential amino-acid, it is debatable whether 1·2% alanine or 0·6% is physiologically equivalent to the methionine so far as α-amino nitrogen is concerned. Since, however, 2% methionine was used in the maintenance and 1% in the curative experiments, it seems clear that the alanine does not have the beneficial action of methionine, and that the curative effect of the latter is not merely due to feeding extra α-amino N. This point is also brought out in the experiments with the amino-acid mixture, where there was a larger increase in amino N than is produced by the addition of 1% methionine, without improvement in urinary N excretion. However, there is another complication here, because the amino-acid addition contained as much methionine as could have been present in the 8% casein addition, previously shown to be effective. It is true that the remainder of the mixture was not the same. It was compounded with amino-acids available to us at the time; but we do not consider the difference due to the inclusion of unnatural isomers, as Kinsey and Grant (1944) and Madden et al. (1944) have recently stated that these are not antagonistic to the natural isomers in rat nutrition. Our present provisional interpretation is that absorption of the free amino-acids themselves is much more rapid than of the amino-acids as gradually liberated in the gut by digestion from a protein; and that, in the rapid absorption of the mixture, the methionine escapes fixation. The normal behaviour of the control animals upon the amino-acid mixture excludes the possibility that small impurities in one of the synthetic amino-acids inhibits the action of the methionine.

Clearly more investigation is needed, but the facts at present show that methionine is the most effective amino-acid in relieving the N loss.

Protein hydrolysates and mixtures of individual amino-acids have been used recently to replace proteins for the maintenance of N equilibrium in dogs and also in human patients (Bassett et al. 1944); for review see Gaunt (1944). In the absence of tryptophane, lysine or methionine protein hydrolysates were ineffective (Elman 1939, Holt et al. 1941, Albanese et al. 1941, 1943). Earlier Cuthbertson (1936) was unable to reduce N losses in the urine in patients with fractures by supplements of cystine or glycine; he thought this might have been due to lack of protein in the rest of the diet. In a memorandum to the War Wounds Committee, which only recently came to our notice, Cuthbertson (1942b) suggested the importance of giving proteins rich in sulphur-containing amino-acids in burns to replace skin losses of these amino-acids.

These experiments show that the burn produces a nutritional deficiency which simulates a toxæmia; it is therefore another example of a deficiency imitating toxæmia, with the added important point that the extra call for the food factor is due to pathological strain. Here the experimental demonstration that one amino-acid can replace the extra protein supports directly the hypothesis that the N loss is due to the raiding of tissue-protein molecules for methionine; the failure of alanine shows that $-NH_2$ N is not enough. But the simple idea that methionine is needed to replace the sulphur lost in the skin is not consistent with the failure of cysteine. This leads us to the view that methionine is here exerting its other well-known function—that of methylation—the evidence for which has been well summarised by du Vigneaud (1942). So far we have no indication that the livers of these animals at this stage are not functioning properly (Clark and Rossiter 1944); in fact much of the previously reported damage to the liver in burns is to be explained as due to the use of tannic acid (Wilson 1942, Cameron et al. 1944). See also Wells et al. 1942, Erb et al. 1943, Cameron et al. 1943, Barnes and Rossiter 1943, Hartman and Romence 1943.

Meanwhile, as a practical outcome, since methionine can be given in fluid form at a time when a patient would be unable to take protein as such, these experiments justify a clinical trial.

Summary

1. Metabolic experiments on burned rats show that increase in the dietary protein substantially reduces the tissue wasting (with its accompanying loss of nitrogen in the urine) seen when the animal is maintained on diets of low or moderate protein value. This underlines the importance of high protein intake for patients suffering from burns, and suggests its value in other conditions where large areas of skin are lost.

2. The urinary losses in nitrogen after burning were reduced substantially by the inclusion of 1% methionine in the diet. Neither alanine, nor a mixture of synthetic amino-acids, nor cysteine, had a similar effect. It is suggested that the apparent toxæmia is in reality a deficiency, induced by a call for one amino-acid with consequent raiding of a whole protein molecule.

3. During the period when patients suffering from burns cannot ingest much protein, methionine should be tried in the hope of stopping the nitrogen loss and consequent tissue wasting.

One of us (P. B. C.) is indebted to the Medical Research Council for a personal grant; both the Medical Research Council and the Nuffield Committee (Oxford) have contributed towards the cost of the investigation. We are much indebted to the Ministry of Supply for synthetic amino acids, especially methionine, which made the research possible, and [illegible] Thanks are also due to [illegible] in the early stages, [illegible] and Mr. C. W. Carter for helpful criticism. This work has been carried out under the ægis of the Burns Subcommittee of the War Wounds Committee of the Medical Research Council.

Appendix I

CREATINE EXCRETION AND LEVEL OF PROTEIN INTAKE

Clark et al. (1944) found that following a severe burn (75° C for 30 sec.) rats showed a sharp rise in creatine excretion in the 2 days after the burn. There was also a slight but constant fall in creatinine excretion in the 24 hours after the burn. The latter effect was thought to [illegible] n resulting from the [illegible] ch the rats were bu[illegible] made upon the cre[illegible] burning, when the rats were maintained on different levels of protein intake. The number of rats observed is necessarily few since, as mentioned previously, the temperature of burning was subsequently reduced to 73° C. However, the observations made confirmed the results of Clark et al., and also indicated that although an increased protein intake reduces the loss of N as urea and ammonia, the sharply defined creatinuria caused by a burn was unaffected by the protein level of the diet.

Table VII shows the mean excretion of creatine N for the day before, and the 3 days after, a burn at 75° C for 30 sec., for groups of rats maintained on various levels of protein intake.

It will be seen that neither the duration nor the extent of the creatinuria is affected by changes in the protein content of the diet.

Appendix II

STATISTICAL NOTE

Protein.—The sum of the nitrogen excretions for days 5–11 and days 5–13 inclusive was calculated for each rat.

TABLE VII

Protein intake	Day before burning	Days after 1	2	3
4·5% (3 rats)	0·4	5·3	2·4	0·8
14·5% (3 rats)*	0·6	5·8	3·6	1·8
22·5% (3 rats)	0·6	5·7	2·6	1·3

* Including three values from the report of Clark et al.

From these collected values the standard error of the mean (ε) was determined by the usual method.

The standard error for the difference of the means for the burned and control animals, on each of the experimental diets, and also the P values for the differences, were calculated using Fisher's formula. In calculating these differences for the raised-protein diets, we have included the control animal CD, which behaved very abnormally (see table II). If this and its burned fellow are excluded, the total mean difference between "burned" and "control" is reduced from 71 to 25 mg. N. Similarly a corrected fig. 1 no longer shows any appreciable separation of the curves on days 5–7.

Amino-acid supplements.—In the maintenance experiments the cumulative nitrogen loss in 10 days after burning was calculated for each rat, by reference to the mean N excretion of that rat during the preliminary 4-day period. From these values the mean cumulative loss for each group of rats was determined, together with the standard error of the mean (ε). These figures are shown in table VIII.

TABLE VIII—STATISTICAL ANALYSIS OF THE RESULTS OF THE MAINTENANCE EXPERIMENTS WITH METHIONINE AND ALANINE

Diet	Mean cumulative N loss in days 4–13 (±2ε)	t	P	Difference between mean N loss and loss on the basal diet (±2ε)	t	P
Basal ..	342 ±95	7·201	< 0·01	..	..	..
2% Methionine	101 ±82	2·469	0·05–0·02	241 ±740	3·434	< 0·01
1·2% Alanine	298 ±95	6·300	< 0·01	44 ±145	0·605	0·6–0·5

It will be seen that the losses on both the basal diet and on the diet supplemented by alanine are highly significant, and that the loss on the methionine-supplemented diet is less significant. Further, comparison of the losses on the two supplemented diets with the loss on the basal mixture, shows that the apparently beneficial effect of the methionine is highly significant, while the alanine has no significant effect whatever. Similarly when plotted graphically it is seen that the lower limit for the losses on the basal diet and the alanine-supplemented diet (i.e., the mean loss −2ε) still exceeds the upper limit (i.e., the mean loss +2ε) for the loss with the methionine supplement.

In the curative experiments the standard errors of the mean losses on the methionine and the amino-acid mixture supplements were calculated as in testing the statistical significance of the benefit from increased protein intake. For comparison, the values for the experiments on the basal diet, the increased protein, and the two amino-acid supplements are all given in table IX.

TABLE IX—CURATIVE EXPERIMENTS

Mean cumulative N loss	Control (±2ε)	Burned (±2ε)	Difference (±2ε)	P
Basal diet:				
Days 5–11 ..	972 ± 56	1247 ± 66	275 ± 80	< 0·01
Days 5–13 ..	1272 ± 66	1573 ± 84	301 ±107	< 0·01
Extra protein:				
Days 5–11 ..	1410 ± 80	1481 ±139	71 ±160	0·4–0·3
Days 5–13 ..	1825 ± 79	1886 ±175	61 ±192	0·6–0·5
1% Methionine:				
Days 5–11 ..	1054 ± 78	1107 ± 74	53 ±107	0·4–0·3
Days 5–13 ..	1368 ± 94	1410 ± 95	42 ±134	0·6–0·5
Amino acid mixture:				
Days 5–11 ..	1084 ± 85	1283 ± 72	199 ±114	< 0·01
Days 5–13 ..	1394 ±100	1612 ± 98	218 ±141	< 0·01
1% Cysteine*:				
Days 5–13 ..	..	..	300 ±133	< 0·01

* On the cysteine supple[illegible]

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UTERINE GRAFT OPERATION FOR GENITAL PROLAPSE

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THIS operation was designed primarily for genital prolapse complicated by some condition of the uterus, other than carcinoma, suggesting the advisability of hysterectomy. These complicating conditions were generally either moderate enlargement due to small fibroids or to fibrosis, or uterine hæmorrhage. Such cases may be dealt with by vaginal hysterectomy and suture of the transverse ligaments, but the late results of this combined operation are not always satisfactory, and if prolapse of the vaginal walls should recur a second operation is particularly difficult.

During the first year in which I practised the operation I kept to these limited indications and consequently used the method in only a few cases. It proved so satisfactory, however, that I have since employed it more generally, especially in cases in which cystocele is the chief factor and in which stress incontinence exists. Cure of such incontinence by direct suture of the muscle tissue which should support the urethra is often difficult, the tissue being often very fragile, and the results are sometimes unsatisfactory, especially in the obese. In the technique to be described control is restored without any suturing of this layer of muscle.

THE OPERATION

The operation is a modification of the valuable interposition operation originally described by Wertheim; indeed so small a modification that it may well have been practised occasionally by surgeons who have not thought it worthy of special description. But from experience in some 40 cases I believe that it is a useful modification. Its particular feature is the use of a strip of the posterior wall of the uterus to form a living musculo-peritoneal graft interposed between the bladder and the anterior vaginal wall. The purpose of the graft is to reinforce the anterior wall, to ensure which the raw surfaces of the graft and the vaginal wall are closely approximated by sutures. The graft is, however, so fashioned as to fulfil another function—namely, to fit into the subpubic angle in such a way as to support the dislocated urethra in cases of stress incontinence.

A bladder sound is passed to ascertain the degree of dislocation of the urethra from its normal subpubic attachments and to define the lower limits of the bladder on the cervix. The amount of vaginal wall that should be removed is estimated and a decision reached as to whether the vaginal portion of the cervix should be removed. Generally, I think, it is advisable to remove it along with the resected portion of the body of the uterus.

The cervix is drawn down and a transverse incision is made just below the edge of the bladder as defined by the sound. The vaginal wall is then separated from the bladder by sliding blunt-pointed scissors along the line of cleavage between the vaginal wall and the bladder as far as the base of the urethra. The vaginal wall is incised vertically and separated *for an appropriate distance from the bladder*; there is no need to define the layer of pelvic fascia by separating it from the vaginal wall. The bladder is then separated from the uterus by blunt dissection, aided by a few touches with the knife, and the vesico-uterine pouch of peritoneum is opened, the anterior edge of the cut peritoneum being caught by forceps for identification later. The body of the uterus, often somewhat enlarged, is delivered through the opening in the *peritoneum*.

The next step is resection of the whole of the anterior part of the uterus, including the cavity. The uterine attachments of the round ligaments, tubes, and ovarian ligaments are left intact, and it is usually possible to complete the resection without dividing the uterine arteries, though, if they are very tortuous, they may have to be divided. This may be done without affecting the nutrition of the strip, which is maintained by branches of the ovarian arteries. In order to make sure that the strip is not being cut too thin, especially in the lower segment, a finger of the left hand is held along the posterior surface of the uterus while the resection is performed with the right. Below the level of the attach*ments of the transverse ligament the incision is deepened and* the vaginal portion of the cervix removed. Vaginal hysterectomy has thus been performed—total as regards the mucous lining, subtotal as regards the posterior wall. The remaining part of the lower segment retains its attachments to the transverse ligament.

The strip or graft is now sutured into position. The anterior edge of the utero-vesical peritoneum is sutured to the upper surface of the graft, and two sutures of strong chromicised catgut, one on each side, are passed through the upper aspect of the graft close to the fundal extremity and then through the tissues as close as possible to the periosteum of the subpubic angle on each side of the urethra. A short and strong curved needle is used and care is taken that the needle does not pass right through the vaginal wall. Reinforcing sutures of thinner catgut may be used. The appropriate amount of anterior vaginal wall is now excised and the graft is fastened to the vaginal wall by anchoring sutures and by including the tissues of the graft in the suture which approximates the vaginal edges. Hæmorrhage from the raw surface of the graft has not proved troublesome; generally the anchoring sutures are enough to secure hæmostasis.

Plastic repair of the posterior vaginal wall completes the operation. It is seldom wise to omit this even where the indication is not obvious. A self-retaining catheter is left in for two or three days.

In some respects the operation is easier to perform than the usual plastic repair associated with amputation of the cervix and direct repair of the periurethral muscle. It avoids suture of the vaginal wall to the cervical mucous membrane, and, except in one case, restoration of the urethra to its normal position has cured incontinence. It is rather easier, and perhaps safer, than vaginal hysterectomy.

The method is not suited to all cases of prolapse. Obviously it cannot be used during the childbearing years, nor is it practicable where the uterus is atrophic; *in such a case* the graft would probably be too small to be of any use. It is chiefly called for where the uterus is bulky but not too large to be delivered into the vagina, where there is a large cystocele and stress incontinence, and especially where the endometrium is unhealthy.

RESULTS

The operation has been used in 40 cases in the last five years and the patients have been kept under observation. It has been found that the anterior wall remains strong and resists straining. Two cases *have not* been entirely satisfactory. In one complete continence has not been restored—a failure which I attribute to inadequate suturing of the graft in the subpubic angle. The second case illustrates the necessity of doing a repair of the posterior wall. In this case there was no rectocele and no posterior repair was done. A few months afterwards there was an incipient rectocele.

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An opportunity to observe the fate of the graft by ost-mortem examination was afforded by a third, articularly unfortunate case. This patient was re-dmitted to hospital with pyrexia a month after dis-harge. The blood-urea, previously within normal imits, rose to 91 mg. per 100 c.cm. and she died of uppression of urine 9 weeks after operation. Autopsy howed an old-standing pyelonephritis on the left side, with a perinephric abscess, and a more recent pyelonephritis on the right side. The uterine graft was found to be healthy, well nourished, and firmly adherent to the vaginal wall, while the peritoneal surface was smooth and free from adhesions.

The advantages claimed for this modification of the interposition operation may be briefly summarised as follows: (1) The anterior vaginal wall is reinforced by a viable graft. (2) The endometrium is removed. (3) The attachments of the transverse ligaments to the uterus are preserved. (4) The urethra is held in its normal position close under the symphysis.

FATIGUE FRACTURE OF THE FIBULA

REPORT ON TWO CASES

DAVID A. RICHMOND, MB MANC., FRCS
SURGEON EMS

As Blair Hartley (1943) points out, fatigue or stress fractures, with the exception of those in the metatarsals, until recently have been little known in this country, and their incidence in Great Britain and America appears to be low. Writers from these countries rarely describe more than two cases. On the other hand, Sheller (1939) reports 590 examples from German field hospitals between 1935 and 1936, and of these over 100 are not metatarsal fractures. Probably with the mobilisation into the armed forces of large numbers of young men more cases will appear in the medical journals of the English-speaking nations.

Stress fracture occurs in the fibula 10 times less frequently than in [illegible] six times less frequently th[illegible]urs with equal incidence in [illegible] the bone (Hartley 1943) [illegible] the lower third have been described by Jackson Burrows (1940; 2 cases), Hamilton and Finklestein (1941; a single bilateral case), Ingersoll (1943; 3 cases due to ice-skating in beginners), and Weaver and Francisco (1940; 1 case).

In the last 2 years I have treated 32 cases of fatigue fractures, comprising: metatarsals, 25 cases; upper third of tibia, 5 cases; and lower third of fibula, 2 cases. Because so few cases in the lower third of the fibula have been reported my two cases are described here.

CASE 1.—An NCO of an infantry regiment noticed pain in his left ankle after a cross-country run a fortnight before his admission to hospital. He had been participating in very strenuous infantry training for some weeks. There was a well marked point of tenderness on the fibula about 2 in. above the tip of its malleolus. Radiologically (fig. 1) there was a faint "cloud" of callus about 2 in. above the tip of the lateral malleolus. He was treated by rest and graduated exercises. Two weeks later the callus was more obvious and there was evidenc[illegible]
across the bone.
[illegible]tive when viewed
[illegible]enderness persist[illegible]

weeks later the callus was better consolidated and was forming a buttress across the fibular concavity. Six weeks later the appearances were as in fig. 2, where a cortical crack was now obvious, and the concavity was completely buttressed by thickened cortical bone. He was discharged a week later to an Army convalescent depot still with slight tenderness.

CASE 2.—An infantry soldier during training complained of pain in the left foot after an assault course and was treated for about three weeks for foot strain. At the end of this period the callus around a march fracture of the 3rd metatarsal was clinically obvious and confirmed radiologically. About this time he complained of pain in the left ankle. Clinically there was no visible abnormality but there was a very tender point on the fibula 2 in. above the tip of the lateral malleolus. Radiologically no abnormality could be seen (fig. 3). His symptoms persisted and three weeks later there was radiographic evidence of callus at the point of the fibular tenderness. This was diagnosed as a stress fracture but no fracture line could be seen. With rest and graduated exercises his symptoms subsided and a fortnight later the callus was better calcified and formed a buttress across the concavity as in case 1 (fig. 4). The endosteal bone formation across the fibula is seen again but not so clearly. He was discharged to an Army convalescent depot a week later almost symptomless.

COMMENT

These two cases show all the features described by Blair Hartley as characteristic of fatigue fractures:—

(1) Pain after exercise over one of the long or stressed bones.
(2) Callus which gradually increases in amount and steadily consolidates.
(3) An easily missed fracture line, often no more than a hair-line fissure.
(4) Radiological findings situated on the concave or "stressed" aspect of the bone.
(5) Normal appearance of the bone as a whole.
(6) Absence of any systemic disease.

The two cases are almost identical radiologically with those quoted above, though Weaver and Francisco postulate an infective theory.

Ingersoll remarks that this type of fatigue fracture 2 in. above the tip of the lateral malleolus is found at the point of maximum stress imparted to this part of the bone. It is the point where bending takes place when the foot is laterally rotated and everted, the talus forcing the fibula laterally so that, with the inferior tibiofibular ligament acting as a fulcrum, the fibula bends at its narrowest point. Ingersoll's cases occurred in young boys when ice-skating as novices, and he points out that such beginners usually skate with the push-off foot everted. An infantry soldier carrying out his training over rough ground must be continually everting and laterally rotating his foot and so must produce strain at this narrow part of the fibula.

I gratefully acknowledge the assistance in the interpretation of the radiograms of Mr. I. D. Kitchin, Dr. Blair Hartley, and Dr. R. Fawcitt.

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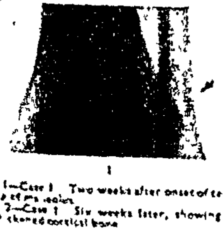
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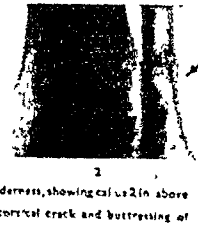
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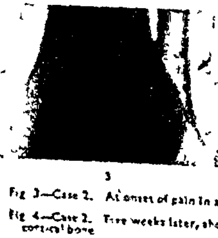
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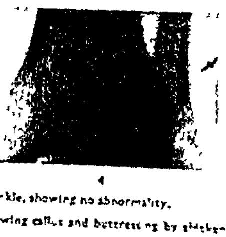
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Fig 1.—Case 1. Two weeks after onset of tenderness, showing callus 2 in. above tip of malleolus.

Fig 2.—Case 1. Six weeks later, showing cortical crack and buttressing of thickened cortical bone.

Fig 3.—Case 2. At onset of pain in ankle, showing no abnormality.

Fig 4.—Case 2. Five weeks later, showing callus and buttressing by thickened cortical bone.

Reviews of Books

Social Aspects of Tuberculosis

S. ROODHOUSE GLOYNE, MD LEEDS, DPH, pathologist, London Chest Hospital. (Faber. Pp. 148. 8s. 6d.)

As welfare work gains in importance the need for serious and well-written textbooks grows; and Dr. Gloyne has here set out much information which will be of value to social workers. Indeed, the book is perhaps less a study of social aspects of tuberculosis than a handbook on relevant aspects of the disease for health visitors and almoners. It avoids, however, the excessive simplification with which lay readers are so often insulted. More might have been said, perhaps, about the Government scheme of maintenance allowances and the possible rôle of tuberculosis almoners; and a greater share of space might have gone to mass radiography, which will certainly present problems for the social worker. This method will lead to the discovery of increasing numbers of early cases, and many of these patients will need guidance on returning to full-time or part-time work. The importance of village settlements and day workshops in reablement is not overlooked, but these are available for relatively few patients. Dr. Gloyne might well have mentioned the need for close cooperation between social workers and the local labour exchanges which must help to find suitable jobs for patients. It is perhaps worth noting that it is now generally held that the Mantoux test should not be considered positive when only erythema is present; and that a control injection is not necessary. Such criticisms hardly detract from the value of the best single book on tuberculosis so far produced for students of social medicine.

Operations of General Surgery

THOMAS G. ORR, MD, professor of surgery, University of Kansas. (Saunders. Pp. 723. 60s.)

IN 700 pages the author has described almost every operation a general surgeon might be called upon to perform. The book is illustrated by a large number of good pictures, in the belief that these can be "many times more instructive than the descriptive text." Indeed, the text has been made "as brief as is consistent with step-by-step description of each operation." This plan has proved quite successful, though the reader may sometimes wish for more detail. Compare for instance the account of the approach to the cervical sympathetic from behind, here, with the precise anatomical directions given by A. K. Henry. Or, again, how is the reduction of a fracture of the neck of the femur brought about? Or how is the bladder freed in a second-stage prostatectomy? But such small omissions are only important because the book is intended for the beginner in surgery. They are outweighed by many merits. Rare operations are described so that any experienced surgeon could carry them out, and wherever the book is opened there is good entertainment for the practising surgeon.

Emergency Treatment of the Injured and Sick at Sea

J. WILSON REID, MD LPOOL, hon. medical officer, HMS *Conway*. (Charles Birchall. Pp. 105. 2s.)

THIS little book embodies an experiment. Justified only by the isolation of a ship at sea, the author quietly and carefully lifts the veil from the conclusion of first-aid treatment and allows the layman, in exceptional circumstances, to become a doctor. Every precaution is taken to guide his actions, and the lucid easy style makes it almost impossible to misunderstand the instructions. The contents, by a remarkable piece of compression, contain in 94 small pages the whole range of first-aid technique, and also, italicised, details of the type of *treatment* which would probably be given by a young house-surgeon, were he available.

There are few points for criticism. Many surgeons would disagree with the giving of sweetened drinks in the expectant treatment of acute appendicitis; and the external and internal application of sulphonamides in severe burns without reference to their extent is likely to lead to trouble. A small note of the technique and dangers of sulphonamide therapy would justify the space, [illegible] time of writing sulphathiazole seems a better drug than sulphanilamide for prophylaxis and treatment.

A chapter on emergency nursing is welcome, and the admirable section on transport of casualties is illustrated by simple but ingenious diagrams. An odd omission is the method of lowering a stretcher into a small boat with a derrick and four cleats, probably the easiest and safest way when the ship's own boat is not available, but this may only mean that it was thought too obvious to require description. There is a good paragraph on Eve's method of artificial respiration by the rocking stretcher, and an appendix on lifeboat ailments which should be useful to those who have to make long journeys in these uncomfortable craft. By way of contrast there is a section on hygiene in the tropics.

Altogether Dr. Reid has produced an unusual and interesting book. A note of caution pervades it, and used intelligently it should prove a standby to unhappy stewards and anxious mates thrown on their own resources amid the perils of the sea. More important, it will give confidence and save lives.

For Childless Wives

By a Doctor. (Published for Family Planning Association by H. K. Lewis. Pp. 16. 2s.)

HOSPITAL outpatient departments, clinics, general practitioners, and specialists will find this well-written pamphlet useful, not only to hand to patients who ask help on account of sterility, but to give to those who are hesitating as to whether to seek advice. It explains what the investigation and treatment of a sterile marriage entails and what hopes there are of success. In the simplest terms it outlines modern methods and ideas, and suggests where and how advice should be sought.

Medical Societies

TUBERCULOSIS ASSOCIATION

AT a meeting in London on Nov. 17 last, with Mr. J. E. H. ROBERTS, the president, in the chair, a discussion on

Work as a Therapeutic Measure in Tuberculosis

was opened by Dr. F. R. G. HEAF, whose paper appears at the front of this issue.

Dr. PETER EDWARDS thought that, in the treatment of tuberculosis, there was a proper time for every measure. An appropriate period of rest should be followed by graduated exercises, and later by work. A sanatorium regime was essential. There was a psychological danger in long-continued rest, and idleness was a calamity. On the other hand, work should not render the patient breathless or cause any systemic reaction. Even when patients had attained the stage of work, they should rest whenever possible.

Dr. W. L. YELL analysed Marcus Paterson's theory of auto-inoculation. He considered that excessive reaction should be treated by absolute rest. The profit motive was the best incentive to work.

Dr. J. H. CRAWFORD described the methods used at Preston Hall. He regarded industrial rehabilitation as a necessary supplement to sanatorium treatment, and felt that work, when the patient was ready for it, was an essential part of treatment. Brieger's work at Papworth promised to be very valuable in the ascertainment of a patient's capacity for work. At Preston Hall patients were carefully observed at work. About 8% of them eventually became settlers, but they had to be medically, industrially, and temperamentally suitable. The prognosis of patients working in a village settlement was better than that of similar patients working under unsheltered conditions. He agreed that it was very desirable to employ ex-patients in sanatoria. It was not necessary that outdoor work should be provided.

In the subsequent discussion it was pointed out that handicrafts should not be started too early for patients who are in bed. The general feeling was that the value of work in the treatment of the tuberculous *lesion* had never been proved, but that there was no doubt of its usefulness in the gradual rehabilitation of the *patient*. Rest, general and local, was of primary importance in healing the disease, but prolonged rest was detrimental to the patient's general welfare.

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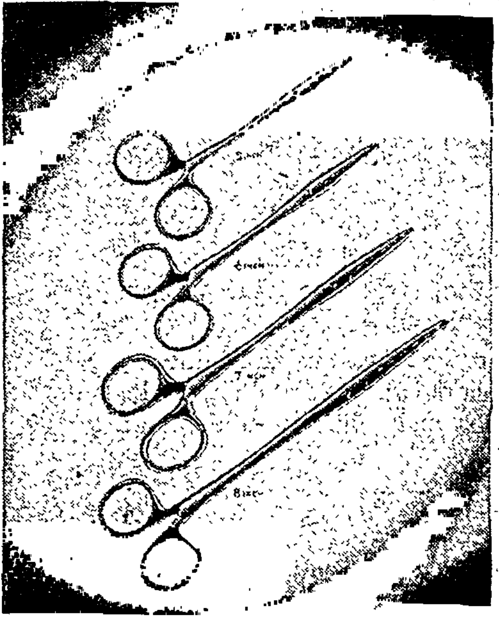

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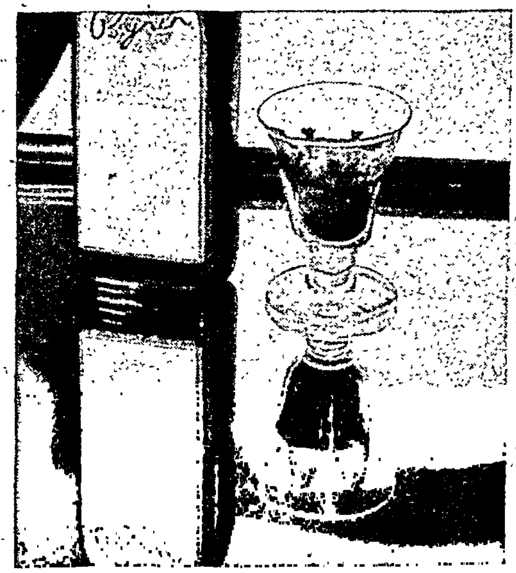

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THE LANCET

LONDON: SATURDAY, MARCH 3, 1945

Our Tuberculosis Service

Few ventures have been launched with better intentions or higher hopes than the tuberculosis service of Great Britain. The Astor report of 1912 defined the problem, and the Public Health (Tuberculosis) Act of 1921 provided means for dealing with it. The aim was, and is still, to prevent a preventable disease, and to care as thoroughly—and hence as economically—as possible for those who have acquired it. In so far as the service has failed, or has had only sporadic and moderate success, we must blame our lack of thoroughness. In a report on reorganisation the Joint Tuberculosis Council[1] give as the first of six faults in the service the fact that it is administered by 188 scheme-making authorities in Great Britain and Northern Ireland; that each of these construes in its own way the words "make adequate arrangements." Central advice about the standard to be attained is lacking. This state of things has been satirised by one of our peripatetic correspondents.[2] A patient living under the ægis of a wealthy well-organised county can get first-class care in a modern sanatorium, or a substantial subsidy towards his maintenance in a sanatorium outside the county. A patient living, perhaps, across the street but coming under a poor borough council will get casual and inadequate treatment in an old-fashioned ill-equipped place where modern methods of treatment are rarely attempted. Or a patient living on the fringes of a county borough may have to undertake tedious journeys to get treatment which is available half a mile away; and at present transport difficulties add to his fatigues. The small poor authorities have a remedy for these deficiencies in their power to combine with other authorities to provide joint schemes. This has been done successfully in three cases: the Staffordshire, Wolverhampton, and Dudley Joint Board; the Gloucester and Gloucestershire Joint Board; and the Warwickshire and Coventry Joint Committee. The smaller authorities in these combinations benefit greatly by the increased facilities thus made accessible to them, and patients in the area covered can count on uniform standards of care. Why these good examples have not been widely followed is not clear, though narrow local patriotism must be partly to blame. The Ministry of Health has no power to compel small authorities to combine.

Waiting-lists are now the rule at sanatoriums, despite the fact—as the JTC committee point out—that tuberculosis is "widely advertised as requiring early diagnosis and treatment." It is the task of the sanatorium to bring the patient to the point at which, with proper home management, his disease will heal, and to teach him the principles by which he must govern his life so as to recover full health More often than not, however, he is prevented from putting these principles into practice by the conditions under which he must live on discharge. Poverty and overcrowding favour the infection: and it is to poor and overcrowded homes that most patients must return. Fresh air and rest are instantly beyond their reach. Under the Ministry of Health order which came into force in 1943, the patient with pulmonary tuberculosis, provided he is likely to recover, is now entitled to money allowances sufficient to relieve him of serious anxiety.

> A man and wife, one of whom is dependent on the other, may receive £1 10s.; for a dependent child over 16 a further 12s. is paid, and smaller allowances, according to age, for younger children. In addition. a rent allowance up to 15s. a [illegible] of 3s. 6d. a week for 26 wee[illegible] for patients with specially [illegible] further discretionary allowa[illegible] be granted. Something ma[illegible] allowances on account of [illegible] patient is receiving, such a[illegible] benefit, disability pension [illegible] from the Ministry of Pensions, or payment from employers. The grants start as soon as the tuberculosis officer has diagnosed a pulmonary lesion with a prospect of cure. While the patient is in sanatorium his personal allowance is reduced by 10s. a week, but he can [illegible] near relatives. [illegible] special allowanc[illegible] help at home.

This is a real advance on the old system, under which a patient had to seek public assistance during his months of convalescence. It must be borne in mind, however, that the grants are paid only to those patients with pulmonary tuberculosis who are believed to have a chance of recovering. Those deemed to be beyond hope of cure must apply for public assistance—an unpopular source of supply, because public-assistance committees are not always sensitive to the patient's needs or pride.

But even a recovering patient needs more than financial security to put him on his feet again—he needs the prospect of work and the assurance that he will be fit to do it. The committee note that no area in the country has an adequate scheme for the rehabilitation of patients leaving sanatoriums; and this is probably the most serious indictment of our service as it stands. We might learn from the principles applied in some cities of the Soviet Union, where tuberculous patients who are fit enough to work enjoy certain privileges: they are given suitable work, released from night-shifts, and allowed extra rations; and if it is thought necessary, they go at night to sanatoriums where they have the care of a doctor and nurse and get their rest in hygienic comfortable surroundings. The first three measures are unquestionably sound, but whatever the advantages of the last, it would probably be unpopular in this country. British patients would almost certainly hold that if they were well enough to work they were well enough to enjoy the hazards of home life, and it would be hard to convince them otherwise. A re-ablement programme, however, has plenty of ground to cover before the question of night sanatoriums need be raised. At present a tuberculous patient has no guarantee that he will get any work at all, let alone suitable work.

The committee believe that a revised programme of reablement should be administered by a senior tuberculosis officer, with a staff of workers trained in social investigation and with full knowledge of local agencies capable of giving help. The tuberculous family should be regarded as a unit for treatment and the service should ensure to them not only an adequate home but proper food, medical care and supervision, home-helps, and when necessary foster-homes where the children can live out of harm's way. If the patient needs training in a new type of work he must have it; an appropriate job must be waiting for him as soon as he is capable of doing it. Dr. Heaf, in his article in this issue, urges the need for a simple way of assessing the safety limit of a patient's energy output, so that the sanatorium can guide him to take up an occupation with an energy output well within safety limits. The colony and the sheltered workshop will have their place in the scheme, and all must be linked with the clinical side of the service: every patient must have access to every method used for diagnosis or treatment. These principles are the theme of a film lately prepared by the National Association for the Prevention of Tuberculosis—a documentary which explains to the general public the opportunities for cure, after-care, and reablement on which a tuberculous patient should be able to count. It shows patients being trained for new work while in sanatoriums, and discharged patients who have found suitable work and continue to do it successfully; and the incidents are well presented. But the film is perhaps a little too rosy: it shows what we would like to achieve rather than what we have achieved so far.

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[1] Report of the Committee on Reorganisation of the Tuberculosis Service. Copies from the Honorary Secretary, Joint Tuberculosis Council, 1, Becket Street, Oxford.

[2] Lancet, 1942, ii, 70

Our method of notification also calls for revision. At present there are no half measures for the suspect: a patient must be either notified as tuberculous or left with no warning label at all. In the case of children this is especially unsatisfactory since the label "tuberculosis," like "mental defect," is apt to impose a stigma which may last for life. Moreover, as the committee point out, the present form of notification is a statement of opinion rather than fact, and fails to differentiate between primary infection and progressive illness. They propose two forms of notification: full notification for infectious or active disease, and "intimation," or provisional notification, to cover primary infections in childhood, cases of doubtful activity, phlyctenular conjunctivitis, and erythema nodosum. The discovery by the tuberculosis officer of a primary complex or a positive tuberculin reaction in a child under five should often lead, as the committee point out, to the discovery of an adult with an unsuspected active lesion.

The report foreshadows many necessary advances, but on p 288 a correspondent points out that as a plan for a reorganised and fully adequate service it is incomplete. For example, recommendations that institutional beds shall be numerous enough to ensure that no patient waits more than a fortnight for a bed, and that emergencies should be admitted immediately, cannot be fulfilled until we have discovered how to provide sufficient nursing and domestic staff for sanatoriums. This is tied up with the reorganisation of the nursing profession, the proper protection of staff against infection, and the provision of proper care for nurses who acquire the disease. Moreover, fresh problems will be raised as soon as mass radiography becomes a routine; and the extent of these problems can be gauged from the MRC report reviewed on p. 284. Though we are incapable of dealing properly with the patients diagnosed by current methods, we shall then be faced with much greater numbers of early or suspected cases, many of which will need sanatorium treatment, while all will need to be watched. If we are to deal with tuberculosis rationally, we must apply ourselves seriously to the task of staffing the necessary beds.

How Penicillin Works

It would be a salutary discipline for every bacteriologist working on penicillin to re-read Fleming's original communication on the subject.[1] Fleming described his first observation in this way: "It was noticed that around a large colony of a contaminating mould the staphylococcus colonies became transparent and were obviously undergoing lysis." If the product of the mould to which Fleming gave the name penicillin had merely killed the cocci or prevented their further multiplication, the colonies within the zone of influence of the mould would have been indistinguishable from those more remote. So we owe the discovery of penicillin to the lysis of bacteria which had been acted upon by it. In this original paper Fleming referred to penicillin as a bactericidal agent and gave details of an experiment which demonstrated its lethal action on staphylococci in broth at 37° C. From this experiment he concluded that penicillin belongs to the group of slow-acting antiseptics, since staphylococci were completely killed only after an interval of 4½ hours, even in a concentration 30 to 40 times stronger than is necessary to inhibit completely the culture in broth. However, Florey and his colleagues,[2] as a result of in-vitro experiments, concluded that penicillin is bacteriostatic and not bactericidal, at least in concentration likely to be used therapeutically. Impressed by their findings and influenced by the mode of action of the sulphonamides, most British workers have accepted penicillin as bacteriostatic rather than bactericidal, though there has been a tendency to use non-committal terms such as antiseptic, antibiotic, antimicrobial, antibacterial, and inhibitory. For example, Garrod,[3] whose opinion on antiseptics demands the greatest respect, wrote: "Penicillin is in a true sense an antiseptic rather than a germicide: *it does not kill bacteria quickly.*" More recently[4] he has amplified this statement by experiments in which penicillin was examined to see how far it conformed to the general laws governing the action of disinfectants. His results agree with Fleming's original view that penicillin is to be classified among the group (which includes the amino-acridines) of slow-acting antiseptics. Thus its action was affected by changes in temperature, and in the reaction of the substrate, and by the age of the bacterial culture. In addition the curious phenomenon was noted that concentrations of penicillin of 10 to 1000 units per cubic centimetre were less actively bactericidal than a concentration of 1 unit per c.cm., a finding that may be related to impurities in the drug.

There seems to be no alternative to accepting penicillin as bactericidal. But the statement must be qualified. It has been demonstrated that penicillin is actively bactericidal in an environment in which

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1. Fleming, A. *Brit J. exp. Path.* 1929, 10, 226.
2. Florey, M. E , Florey, H. W. *Lancet*, 1943, i, 387.
3. Garrod, L. P. *Practitioner*, 1944, p. 321.
4. Garrod, L. P. *Brit med. J.* Jan. 27, 1945, p. 107.

multiplication of bacteria occurs or is capable of occurring. In other words, unlike most other bactericides, penicillin acts best in good culture media such as broth or serum, and poorly or not at all in water or in solutions of non-nutrient salts such as sodium chloride. A further peculiarity of the action of penicillin is that, although in broth at body temperature it may kill large numbers of sensitive bacteria such as staphylococci, it does not always, even in high concentration, kill all the bacteria present. The number of survivors is small, not usually exceeding one or two per million of those originally present, but these few suffice to prevent sterilisation of the culture. Since penicillin is slowly destroyed in broth at 37° C it may, after a few days' incubation, have been reduced to less than an inhibitory concentration while survivors remain alive. These then multiply and cause turbidity of the broth. The reason for penicillin's failure to attain complete sterility in broth has had little attention. Most workers have accepted the facile explanation that the survivors are individuals with abnormally high resistance to penicillin. **Bigger**[5] regards the survivors, which he terms persisters, as being insensitive to penicillin because they are dormant non-dividing forms. Whether he is correct in his suggestion that the occurrence of similar persisters in the body explains the occasional failure of penicillin therapy can only be ascertained by clinical trials.

Miller, **Green**, and **Kitchen**[6] suggest that the mode of action of penicillin may not be very different from that of sulphonamides. Both act on some bacteria while being completely ineffective on others. We do not know why one organism is sensitive and another insensitive, but obviously the difference must depend on some fundamental difference in the biological characteristics or nutritional requirements of the two types. Since not all sulphonamide-sensitive bacteria are sensitive to penicillin, and not all penicillin-sensitive bacteria are sensitive to sulphonamides, the mode of action of the two must differ in some important respect. **Gardner's** early observation[7] that bacteria in the presence of penicillin enlarge without dividing suggests that penicillin acts by preventing division, and that this in some way causes the death of the bacteria. Many other workers have confirmed **Gardner's** observation that in the presence of penicillin abnormally large forms of cocci and long forms of bacilli are found. An attractively simple theory of the mechanism of penicillin action at once suggests itself. Penicillin prevents cell division but not cell growth; the cell increases in size; it bursts. Such a mechanical theory is almost certainly too simple to be true, but it has at least one feature which fits in with observed facts. **Fleming's** attention, as we have seen, was directed to the action of penicillin by the lysis of staphylococci, and **Todd**[8] has lately demonstrated that all the sensitive bacteria he examined—pneumococci, hæmolytic and non-hæmolytic streptococci, staphylococci, and *Cl. welchii*—undergo lysis to a greater or less extent in broth cultures containing penicillin. He found that a culture usually becomes more turbid before lysis begins and concluded that multiplication is probably an essential preliminary to either the killing or dissolving of the cells. On the other hand, the increased turbidity may be attributable to increase in size of individual organisms without actual cell-division. His viable bacterial counts would fit in with this latter explanation. His experiments do not actually prove that bacteriolysis is due to the action of penicillin. The pneumococcus and some strains of staphylococcus are notoriously susceptible to autolysis, and the former is readily dissolved by such substances as bile-salts. While bacteriophage action appears improbable under the experimental conditions, it cannot be entirely excluded. Or again lysis may be due not to penicillin but to some impurity in the preparation used. However, the most feasible explanation is that penicillin kills bacteria with a minimum of alteration to the bacterial protoplasm, so that autolysis takes place more readily than it does in bacteria killed by the action of heat or of other bactericides.

There is need for further work on the lysis of bacteria treated with penicillin, and the purest penicillin available should be used for the experiments. **Garrod**[9] has called attention to the different behaviour of different batches of penicillin and to the advantage of using almost pure penicillin rather than preparations of which 80–90% is impurity. Lysis should also be studied as an individual rather than a mass phenomenon. This would require a microscope fitted with a warm stage and an observer with almost unlimited patience, but the results should justify his trouble.

Control of Liver Extracts

The liver treatment of pernicious anæmia stands as one of the most striking triumphs of therapeutics. It is so successful and so easily applied that a tendency has arisen to take it for granted, in spite of the fact that the exact nature of the curative factors involved is still unknown and that the best method of preparing liver extracts and their optimal dosage have yet to be decided. Oral treatment requires far larger quantities than are effective by injection, and for this reason the manufacture of liver extracts for oral use has until lately been forbidden, to conserve the raw material. At present, therefore, the problems of treatment centre almost entirely on the parenteral route.

It is difficult to bring home to some doctors that the peculiar antianæmic value of liver is confined to pernicious anæmia, and that this is an entity which can be definitely diagnosed with the aid of laboratory methods. At the annual meeting of the Association of Clinical Pathologists[10] Dr. S. C. **Dyke** laid down as the criteria of diagnosis a megalocytic anæmia, associated with gastric achlorhydria, and responsive (both by reticulocyte crisis and rise in the red cells) to suitable doses of liver or active liver extract. The reticulocyte and red-cell responses can be foretold with great accuracy by means of **Della Vida's**[11] modifications of the formulas of **Minot** and of **Riddle**. This definition of pernicious anæmia makes its diagnosis depend on the response to the liver principle, but the only means yet available of assaying liver preparations is by the response they produce in the blood in pernicious anæmia. It is evident that the failure of a given extract to produce a response in a case of anæmia, apparently of pernicious type, may be due either to impotency of the extract or to irresponsiveness of the anæmia. For this reason those engaged in the assay of liver extracts must have available an extract of ascertained potency as standard.

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[5] Bigger, J. W. *Lancet*, 1944, ii, 497. *Irish J. med. Sci.* 1944, 553.
[6] Miller, [illegible] Green, C. A., Kitchen, A. H. *Nature, Lond.* Feb 17, 1945, p [illegible]
[7] Gardner, A. D. *Ibid*, 1940, 146, 837
[8] Todd, E. W. *Lancet*, Jan 20, 1945 p 74.
[9] Garrod, L. P. *Ibid*, 1944, ii, 673.
[10] See *Lancet*, Feb 10, 1945, p 188
[11] Della Vida, B. L. *Lancet*, 1942, ii, 275.

No extract unproved by clinical test should be accepted as suitable for therapeutic use. It is common knowledge that commercial preparations of liver vary widely in potency and that some indeed are almost inert. The statements often accompanying liver extracts on the market that they "represent" so many hundreds or thousands of grammes of liver are meaningless and misleading. What is needed is some standard of potency; but, though the USA and Canada each have a unit of potency, no such standard is demanded in this country. EMERY and HURRAN[12] have lately suggested that DELLA VIDA's formula as applied to the red cells over the first 14 days from initiation of treatment should be accepted as a reasonable standard of effectiveness, and that the potency of an extract should be expressed in units determined by the dose required to produce this standard response divided by 14. On this basis an extract producing the required response in a dose of 1 c.cm. would be accorded 14 units per c.cm., and an extract doing so only in a dose of 10 c.cm. a unitage of 1·4 per c.cm. Some such standardisation of liver extracts seems to be urgently required, though, as FULLERTON[13] remarks, it will be unfortunate if there are several different systems of unitage.

The criterion of success in initial treatment is rapid restoration of the blood-picture to normal; maintenance presents its own problems. The first task is to keep the red cells at a normal level; the second, of fully equal importance, to abolish or keep in abeyance the nervous manifestations which to a greater or lesser degree invariably constitute part of the disorder. The problems here are not only of dosage but also of the type of extract to be preferred. As regards maintenance dosage, custom varies widely. There are physicians who as a routine give two or three injections weekly; and occasionally this may be necessary. But in many cases a "depot" dose of 4 c.cm. of a potent extract every two or three months will maintain a normal blood-picture. Here, however, a further difficulty presents itself. Of the very large number of patients now regularly receiving parenteral liver treatment an increasing proportion are becoming more or less sensitive to the injections, their symptoms ranging from the common mild and transient urticarial or asthmatic manifestations to the more severe and even fatal anaphylactic shock. DELIKAT[14] and others have shown that it is possible to desensitise such sensitive patients, but this is troublesome. Alternatively the dose may be divided up and given in repeated injections starting with a minimal fraction, and then spaced and increased according to the patient's tolerance. This procedure may take from an hour or so in the less sensitive up to the better part of a day in the more sensitive patient. Knowledge and experience both support the view that the shorter the interval between injections the less the likelihood of sensitisation. As a routine small injections at intervals of 3 or 4 weeks may eventually be found more satisfactory than larger doses at longer intervals. It has been claimed that the more highly purified types of liver extract, such as those composed largely of the Dakin and West fraction, induce sensitisation less readily than the cruder forms containing a high proportion of the total solids of the original liver. Though the validity of this claim is doubtful, it brings into prominence yet a further problem. The well-known fact that in pernicious anæmia either the nervous or the hæmatological manifestations dominate the clinical picture suggests that development of the syndrome depends on deficiencies in at least two separate factors, one affecting the maturation of the red cells and the other nerve metabolism. Many observers suspect that the purer extracts, although active in rectifying hæmopoiesis, have less influence on the nervous and other metabolic disturbances than the cruder ones. Cases are seen in which glossitis recurs and persists in spite of the maintenance of a satisfactory red-cell level. It has become clear that liver contains a number of factors, deficiency (and possibly also imbalance) of which may bring about pernicious anæmia. Liver is a rich source of vitamin B_1 and of the whole B_2 complex, and it is the custom of many manufacturers of the highly refined extracts to reinforce them with aneurine and all the known B_2 factors. Whether or not these highly refined and reinforced extracts can satisfactorily replace the cruder types remains to be decided.

The outstanding questions can be answered on by collaboration between clinical observers and th makers of the therapeutic preparations. No pr paration should be allowed on the market until i worth has been proved, and this can be done only b clinical trial. Cases suitable for trial purposes a not rare, but in present circumstances their val for assay purposes is too often ruined by the indi criminate use of liver before they reach a centre a which treatment can be controlled. The Ministr of Health has laid it down that "no person sha administer any liver extract or cause or permit an liver extract to be administered, to a person who i not suffering from pernicious anæmia or from som other megalocytic anæmia."[15] It is impossible t diagnose pernicious anæmia in the absence of detaile laboratory investigation, and a case can thus b made out for distributing liver extracts only throug properly staffed and equipped anæmia clinics. Th would give some assurance that diagnosis precede treatment; it would thereby do away with muc waste of time and material; and it would mak plenty of subjects available for the essential assa of preparations as a condition of distribution. A precedent is even now coming into existence in control of penicillin supplies.

THE Medical Research Council have appointed Prof A. A. MILES, FRCP, of the chair of bacteriology at Un versity College Hospital medical school, to their s at the National Institute for Medical Research as fro Oct. 1, with a view to his becoming director of th Department of Biological Standards on the retirement Sir Percival Hartley, FRS, next year.

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[12] Emery, W. B., Hurran, W. J. *Brit. med. J.* 1945, i, 75

[13] Fullerton, H. W. *Ibid*, Feb. 10, 1945, p. 197.

[14] Delikat, E. *Ibid*, 1943, i, 539.

[15] Statutory Rules & Orders (1944) No. 32. Made by the Ministr of Health under Regulations 55 of the Defence (General) Reg lations, 1939.

Annotations

HUNGRY NEIGHBOURS

EVERYONE is now familiar with reasons why, long after liberation, the people of France and Belgium are physically no better off than they were under German rule. We know that most French and Belgian ships are needed in the Allied Shipping Pool, which has to serve the war in the Far East as well as the West We know that the Continental ports in Allied hands have worked to capacity. We know that shortage of locomotives, trucks, and lorries often prevents the transport of food from one part of the country to another. We are also told that everything possible is being done to relieve the situation.[1] Yet the fact remains that we are missing a golden opportunity to prove, as a people, that we really care about our neighbours and Allies. Is it quite certain that more of the supplies sent to this country for civilian consumption could not usefully be diverted to France, Belgium, and liberated Holland? The French Minister of Information has stated (rightly or wrongly) that Britain, with six months' stocks of all commodities, is still importing 2 million tons a month, whereas France, with only a day's stock of food, coal, and other essentials, is importing only 150,000 tons.[2] In this country nutrition is said to have improved rather than worsened during the war, and in the past six months the diet here has if anything grown better. On the other hand, to give a single instance, our special correspondent reports on p. 281 that when he left Paris at the end of January no fat of any kind had been distributed to the citizens since December. Lack of fats in Paris in the cold weather may be primarily due to lack of transport; but a writer in the French journal *Combat* remarks that the liberating armies have used for their own purposes 60% of the surviving French locomotives and goods wagons[3] He and his fellow-countrymen are well aware that war needs come first, but he reasonably asks how far this doctrine is to be pushed. The *Manchester Guardian* inquires "what would be said here if the French urged that civilian transport in Britain and the United States should be reduced to a point at which people died of hunger and cold because food could not be moved from one place to another?"[2]

It was fortunate for us that the government and people of America saw fit to regard the food resources of the United Kingdom and the United States as a common pool. The result has been that for years we have had enough to eat. The official view, based on experience, is that the food-supplies of the British people could not be reduced without possible harm to our output, health, and morale[4]; and last Tuesday Mr. Churchill rejected the idea of reduction But few will wish their morale to be maintained at the cost of Allied populations who have suffered far more severely than ourselves. To meet an emergency the British public would certainly be willing to accept stricter rationing for a time, if that would do anything to relieve our neighbours' plight and so serve the purposes for which the war is being fought

PACK PALSY

CARRYING heavy packs during military training can produce a paresis of the shoulder girdle musculature from nerve injury. The isolated serratus palsy is a well known lesion sometimes associated with specific fevers, febrile 'brachial neuritis,' or protracted malposture on the operating table, but usually traumatic. The typical picture of the condition in civil life is that given by Overpeck and Ghormley,[5] who recorded 28 cases, the majority in labouring men affected in the right shoulder; 23 had a clear history of trauma, and, though prognosis for function was fair, gross scapular winging often persisted.

In this war, in military hospitals, a rather different type of case has been seen—an isolated serratus palsy after carrying a heavy pack. Woodhall[6] claims that the lesion is common and describes 3 atypical cases demonstrating bilateral affection, additional involvement of the trapezius and other scapular muscles, and paralysis of the trapezius alone. The actual trauma may consist of one or many days' training with a pack, or the acute strain of heavy lifting; and there is some predisposition in people with long necks and oblique sloping shoulders, and in cases where previous damage to the accessory nerve has already allowed the scapula to sag. The results of treatment in recorded cases are dismal; recovery is slow and rarely complete, and the men become sullen and resentful habitués of military hospitals. It may be that earlier recognition would favourably affect the prognosis, as Ilfeld and Holder's case[7] shows; here complete recovery occurred after a month's muscular relaxation in a modified spica holding the arm adducted to the side with upward pressure beneath the flexed elbow. But such cases are likely to be rare, and it seems wiser as a rule to return Service patients to duty in a lower category after a few weeks of development of [illegible]

It is interesting to speculate whether [illegible] recorded paralyses were in fact specific or [illegible] syndromes which have since become recognised. [illegible] one of Richardson's cases,[8] with tingling [illegible] the radial side of the forearm and in the [illegible] fingers, might have fitted into our [illegible] cervical intervertebral disc prolapse [illegible] carrying a heavy pack with shoulder [illegible] the ideal way to produce the [illegible] bracing of the shoulders which is the [illegible] costoclavicular compression of the [illegible] Perhaps further cases, reviewed [illegible] neurological features in the [illegible] accompanying the obvious [illegible]

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[1] See *Lancet*, Feb. 24, p. [illegible]
[2] *Manchester Guardian*, Feb. 19, p. 4
[3] Quoted in *Manchester Guardian*, Feb. 19
[4] Food Consumption Levels in the United States, Canada and the United Kingdom. HMSO, 1944
[5] Overpeck, C. H., Ghormley, R. K. *J. Amer. med. Ass.* 1940, 11[illegible]

Intensive treatment of early syphilis, either with penicillin or arsenicals and bismuth, is now becoming universal in the Armed Forces, and considering the importance of the seaman's rôle in the national life, especially in time of war, it seems only right and economically sound that facilities for these more rapid methods of treatment should be provided at all the chief ports of the Empire. Syphilis declaring itself on the high seas or in foreign ports may, after diagnosis, have to be initially treated by standard methods, but treatment could then be rapidly concluded when the ship reached home. Time-honoured methods, involving weekly injections over months or years, often result in default among shore-going patients, and only too often they spell disaster to the seaman. Usually he is faced with the alternative of either relying on such intermittent treatment as he is able to get when his ship touches at a foreign port, or of "swallowing the anchor," trusting to get an uncongenial and worse-paid job ashore. Not unnaturally he normally takes the former course, often with tragic consequences.

Is there any reason why syphilis should not be notified and compulsorily treated in the Merchant Navy as it is in the Armed Forces? The fact that merchant seamen live in such close community makes this highly desirable; and, were the principle enforced by statute, the criminality of concealment would follow. There must, however, be no penalisation, and in cases where a short period of hospital care is necessary, in both the seaman's and the company's interests, it would be inadvisable that the patient should lose any pay. Venereal disease among seamen can almost be said to be attributable to conditions of service.

All United States merchant vessels now carry an officer, usually the purser, who has had four months' training in the elements of medical and surgical treatment, including that of VD. It is not clear to what extent these officers actually carry out treatment, but with suitable safeguards, which should include the "logging" of each case treated and the amount of drugs expended, there is no serious objection to their treating gonorrhœa. The treatment log would then be checked at the home port by a responsible medical officer, and the patient obliged to attend a clinic for tests of cure on his return. The diagnosis and treatment of syphilis, on the other hand, must always remain the responsibility of a qualified expert; and indeed all cases of genital ulceration should be sent to hospital at the earliest opportunity.

CHARING CROSS MOVES WITH THE TIMES

In the opinion of the Middlesex County Council public health committee, the new plans for Charing Cross Hospital foreshadow "a degree of coöperation between voluntary and public services which has never before been achieved." These plans provide for the rebuilding of the hospital, with about 1000 beds, on the Northwick Park golf-course near Harrow. In a letter presented to the council last week Mr. Philip Inman, chairman of the hospital, shows that three departures from precedent are contemplated. First, it will be necessary, he writes, to provide 100 beds for the care of the chronic sick—"a type of patient which has hitherto not been admitted to the majority of teaching hospitals, notwithstanding the fact that doctors in general practice have to treat such patients." Secondly, though it is essential for a teaching hospital to maintain some selection of cases, Charing Cross is willing to set aside a proportion of beds for local needs and use them to provide a complete hospital service for the inhabitants of a definite area: except for certain infectious diseases, and mental disorders requiring observation, it would, like a municipal hospital, undertake to admit all cases applying from its area and needing inpatient care. Thirdly, the medical school would welcome an arrangement whereby undergraduate students would be seconded to a county hospital for 3–6 months of their clinical training: during this period "they would have opportunity of being instructed by the council's medical staff upon types of cases not infrequently encountered in the wards of voluntary hospitals, and would also learn something of the social and health services developed in the county."

Mr. Inman quotes a remark by the president of the Royal College of Surgeons that "the great need of the moment is to bring together those who are natural partners in the planning of a health service and to get them to go forward in full partnership." He thinks of the proposals as an experiment in coöperation that may go far to remove the barrier, "set up largely by insufficient knowledge and wrong thinking," between the voluntar and municipal hospitals. He hopes, as we all do, fo a new unity among those whose common concern is th welfare of the sick.

AUSTIN FLINT MURMUR

Austin Flint can hardly have guessed, when he published his paper *On Cardiac Murmurs*[1] in 1862, that i would result in his name being handed down to generations of students, and much heart-searching amon cardiologists. For he described only 2 cases with th "presystolic blubbering murmur" since attached to hi name, and saw it for what it is—an extreme rarity Every student up for his final is now familiar, in theor at least, with the presystolic apical murmur in cases o aortic regurgitation without mitral disease, but there ha always been a suspicion that as often as not when a Flin murmur is diagnosed there is a coincident mitral stenosis

Luisada[2] has made a phonocardiographic study of 2 patients with aortic incompetence due to syphilis o atherosclerosis, in none of whom was there any evidence of rheumatic heart disease, and has demonstrated some acoustic phenomena at the apex which might be confused clinically with Flint's murmur, though they have little in common with the blubbering sound he described. These noises can be divided into three groups. In group 1 a diastolic murmur apparently arose from functional changes in the ventricular wall; on analysis this rumble was found to be made up of a loud auricular sound either alone or plus a loud third heart sound. In two of the patients in this group a Flint murmur had previously been diagnosed with the stethoscope. In group 2 the phonocardiogram showed that what had been called clinically a crescendo presystolic murmur was actually a distorted first sound occurring in systole. In group 3 there was splitting of the first sound produced by separation of either its two valvular components or its musculovalvular components; here, if the second part of the split sound is mistaken for a normal first sound, the first part may be called a presystolic murmur. Luisada contends that none of his patients had a true Flint murmur, though it had been diagnosed in four of them by competent cardiologists. He mentions, too, that he has found phonocardiographic evidence of mitral stenosis in "many other" cases in which the clinical diagnosis was syphilitic heart disease with a Flint murmur. This douche of cold water on clinical credulity should lead us to insist on a phonocardiographic record before a Flint murmur is diagnosed; and if we are presented with a possible one at our final examination the chances will be on our side if we ex[illegible] disbelief.

Mr. Percy Barter, a principal assistant secretary of the Ministry of Health since 1940, has been appointed a senior commissioner of the Board of Control, and the Minister of Health has appointed him to be chairman of the Board on the retirement of Sir Laurence Brock on March 31. He was secretary of the Board from 1930 to 1939.

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1. Flint, A. *Amer. J. med. Sci.* 1862, 44, 29.
2. Luisada, A. A. *Amer. Heart J.* 1944, 28, 156.

Special Articles

FRANCE TODAY

(FROM OUR SPECIAL CORRESPONDENT)

FOR its information on health, nutrition, and epidemics he French government now relies on reports by the nstitut National d'Hygiène. The institute, which egan work in 1942, published last year a first report rom its director, Prof. A. Chevalier, to the minister of ublic health.[1] More recently it has prepared a series of nultigraphed reports on nutrition, tuberculosis, cancer, lcoholism, epidemic diseases, and venereal diseases hich extend over the period of enemy occupation and he period of liberation up to the end of 1944.

Food

The opening words of the report on nutrition indicate ery correctly both the value and limitation of such tudies:

> "The conditions of nutrit
> occupation v
> to the provisi
> town and cou ... as well as in different social groups; even in the same social group there were great differences."

For these reasons it was, and is, impossible to generalise. The definite statistics of nutrition are those collected in urban areas, but the mortality and tuberculosis statistics throw light on the problem from another direction.

RATIONING AND ITS EFFECTS

It must be explained that rationing in France during the occupation was more elaborate than in this country. Men and women were dealt with separately, as were children from 0–3 (class E), from 3–7 (class J1), from 7–14 (class J2) and from 14–21 (class J3). Manual workers were divided further into those doing heavy and those doing light work. The standard of food requirements accepted is that agreed by the League of Nations. One of the most complete inquiries on food-supply and nutrition was made at Marseilles by the local section of the institute, covering a period of four years. And table I shows the percentage of League of Nations standards of calories, animal protein, and fat received at Marseilles in 1943:

TABLE I

Ration class	Calories (%)	Animal protein (%)	Fats (%)
Adult male .. .	77	43	31
" female .. .	63	40	31
Children 14–21 ..	75	36	31
" 7–14 .	80	63	46
" 3–7 ..	118	60	48

One of the results of the insufficiency of the rations was a fall in the weight of adults in the urban areas. It is stated that in the first year of occupation 70% of adults in towns (male and female included) lost 12% of their weight. After this time the weight slightly increased, but it remained about 10% less than before the war. The adults who lost weight were for the most part over 45 years of age, and those who had been above average weight.

Statistics of loss of weight of workers in two factories in the suburbs of Paris make this point clear. Table II gives the average weights in kilogrammes.

An inquiry by the institute as to the weight of babies at birth (in 1943) carried out in Paris showed that it remained the same as before the war. Children up to 10 years of age also increased normally in height and weight; but after 10 growth both in height and weight was considerably retarded, especially at 14 and 15.

There were also other signs of malnutrition. Of the adolescent girls at a residential institution 70% suffered from amenorrhœa, which was cured by doubling the protein ration from 8·60 to 17·2 g. There were sporadic cases of famine œdema in the civilian population, and epidemics of it in prisons, institutions, and internment camps. Since liberation, despite an improvement in the official ration, there has been a sudden deterioration in the condition of children of the poorer classes in Paris, of whom many have been found underweight. There has also been an increase of vitamin deficiencies at Marseilles.

TABLE II

GENNEVILLIERS (1500 workers)				AULNAY (800 workers)			
Before war	1942	1943	1944	1940	1941	1942	1944
74·1	64·5	65·3	65·5	76·5	66·3	62·3	67·00

Average loss of weight in relation to age:
Under 41 .. 8 kg.
42–47 .. 9·5 kg.
Over 48 .. 12·6 kg.

Marseilles is a large city whose population was particularly badly fed. In the years 1940–42 the food consumed daily by all classes of adults (male, female, light workers and heavy workers) was as follows:—

Carbohydrates ..	262 g.	Protein (animal) ..	21·6 g.
Fats	30·6 g	" (vegetable) ..	42·3 g.

Total calories per diem: 1765. In addition 195 calories were obtained from spirits and wine.

The condition arising from this diet was not directly and immediately serious: there was loss of weight and then stabilisation; there was weakness and inaptitude for work; and there were signs of vitamin deficiency. Nevertheless the years 1940–42 showed a considerable increase in the death-rate compared with 1938.

Inquiries made concerning infants, children of school age, and adolescents (up to 21) in Marseilles, Lyons, and Paris showed that the younger children most nearly approach normal weight. Among adolescents weight was stationary or falling in 31·3% of boys and 39·2% of girls. Among children of 7–10 years 33·4% of girls were below weight and 27·7% of boys.

OCCUPATIONAL AND GEOGRAPHICAL DIFFERENCES

A review of food
reveale
In Mar
had to
1200 calories mark. ... only reached the rationed market and in the black market, could get a full diet. The gross inequalities in distribution of food in France are freely admitted in official publications.

TABLE III

Occupation of parent	Weight lost	Weight stationary	Tuberculosis under 14
Cultivateur ..	2·1	3·5	..
Commerçant .	5·3	3·9	2
Industriel ..	3·6	11·4	4
Professions libres	10·7	15·7	..
Fonctionnaire ..	13·4	22·2	7
Artisan ..	11·2	31·4	3
Ouvrier	35·2	25·1	14

Table III, obtained by examining a large number of school-children in Lyons in 1942–43, shows the percentage with decreasing or stationary weight, arranged according to the occupation of their parents, and in relation to the number of cases of tuberculosis in children under 14.

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[1] Recueil des Travaux de l'Institut National d'Hygiène, vol. 1, 45 rue Cardinet, Paris.

The *cultivateur*, who grows food, is best off; the *commerçant* (small business man or shopkeeper) and the business manager have opportunities of getting about: the *professions libres* (doctors and lawyers) do not do so well but have no tuberculosis; the *fonctionnaire* (civil servant) and the *artisan* (skilled worker) are evidently suffering in diet; but the ordinary *ouvrier* (manual worker) is in every respect worst off.

Another sidelight is found in the differential mortality of the administrative departments into which France is divided. In some departments there has been a rise in the death-rate (calculated per 100,000); in others there has been a decline. The following increases are recorded: urban and industrial areas of Paris and Seine region, 23·1; Marseilles and Bouches-du-Rhône, 54; Bordeaux and Gironde, 12·9; Nord region (industrial) 8·0; Lyons region 27·8. In the departments of Var, Basses-Alpes, and Corsica there have also been large increases in mortality; these three departments are not urban, but they are stony, agricultural, non-productive areas. Death-rates have decreased, on the other hand, in Normandy and Brittany, in the Somme, the Aisne, and the Marne districts, in Nièvre and the Côte d'Or, in the Landes, Lot-et-Garonne, Lot, Aveyron, Puy-de-Dôme, and many other departments.

Thus in looking at the map of France we see that urban areas and certain non-productive rural areas on the Mediterranean coast have deficient food, a high incidence of tuberculosis, and increased general mortality. But around these black areas, neighbouring them, are the rural productive farming areas of France in which food is plentiful and death-rates less than they were before the war.

CAUSES OF MALNUTRITION

The reasons for malnutrition in France are to be found partly in the effects of the long-standing underfeeding during the enemy occupation and partly in the disorganisation of road, rail, and canal traffic caused by the military effort for liberation. The Germans deliberately underfed the people of France. Agriculturally self-supporting for all practical purposes, France was made to yield to the Germans enormous quantities of foodstuffs, and to pay for them as costs of occupation. In the towns there is not only a shortage of food, there is a shortage of all ordinary consumer goods—the things that the housewives of the farming community want to buy as well as the housewives of Paris, Lyons, Bordeaux, and Marseilles.

The Germans also deliberately encouraged the black market, partly as a means of making easy money, and partly as a means of demoralisation.

Ordinary rations of food being insufficient, there was at once a demand in the black market for foods such as eggs, milk, meat, and fruit. Furthermore, for the peasant farmer in France to withhold from the Germans a proportion of the foods he attempted to collect for his own purposes was an act of patriotism. To sell food illegally to French civilians or to Frenchmen fighting in the FFI was an assistance in the war against the German invader. But the secret black-market organisation set up still persists, and is now interfering with food distribution.

The black market cannot be cured entirely by fines and imprisonment; it must be prevented by providing enough food for all, and enough consumer goods for all. The sure way [illegible] to get the work of the factories going again, and the work of the fields. And for that the first need is transport by road, rail, river, and canal.

Despite the best endeavours of the French authorities and the most ample help the Allies can give in provision [illegible]port, of raw materials for the factories, of seed and fertilisers for the fields, and of certain foods t tide the people over until crops are harvested, there bound to be a period of difficulty. But so far there is a least one consoling feature of the French interna situation—there is at present no threat of any epidemi There is in France too the feeling of renaissance, th feeling of a new spirit of the Liberation Movement the renewed determination to act and to conquer th troubles which face her.

Hospitals

The day on which I had arranged a series of visits t Paris hospitals was freezing cold, with the ground covere with snow. And there was practically no coal at all i the city. But my visit to the Hôtel-Dieu reassured m about hospital heating. For the building, though no very warm, was not at least as government offices, banks and private houses were—as cold as a good refrigerator

The doctors I met at the Hôtel-Dieu, who very courteously showed me their wards and discussed thei problems, were among the best-known members of th medical profession in France. In the order in which saw them they were: Dr. Garcier (neurology), Professo Fiessinger (clinical medicine), Dr. Nicaud and Dr. Hen Benard (general medicine), Dr. Barietz (tuberculosis) and Prof. Pierre Brocq (clinical surgery).

One of my first questions was on the subject of heating, because I had been told on good authority that in some places it had been impossible to get coal, impossible to warm the hospital or operating-theatre, and obligatory to refuse even acute abdominal operations Fortunately there was some coal at the Hôtel-Dieu and they had not had to refuse operations; but they were not sure of supplies for more than a few days. This again is a question of transport, and the shortage very seriously impedes the work of office and hospital as well as factory and workshop. At the time of my visit to Paris the electric light and power for offices and homes was cut off in the morning and only turned on again in the evening: but hospitals were privileged and light was available.

Walking round the wards, my chief impression was of overcrowding, and of many elderly surgical and medical cases. Accommodation at the Hôtel-Dieu was, I was informed, 900 beds. But they had had to put in extra beds and had 1200 patients under treatment. There were beds in the middle of the wards; beds coming right up to the doors of entrance into the wards; beds set up very close together; and beds (eight or ten of them) in an entrance hall, open to one of the main corridors, which gave access to an operating-theatre. I was told they had had patients in beds in the corridors.

A large proportion of the patients in the hospital were chronic cases—old people suffering from cold, fatigue, and respiratory affections. There were also a number of cases of fractured femurs in old people. Another class of case emphasised the great increase in acute tuberculosis. A few days before, the Hôtel-Dieu had admitted a man of 56 with the diagnosis of bronchitis; he died in three days and the post-mortem showed acute tuberculosis.

Views of the Medical Profession

At the Hôtel-Dieu surgeons and physicians alike complained of shortages. They were short of insulin, of gland products, of requisites for the laboratory, and of X-ray film. They laid strong emphasis on the ill effects of lack of all heating in the homes of the vast majority of the workers of Paris. For clothes and shoes, they could manage; but food was insufficient. Vitamins, I was told very emphatically, are not the problem; what is needed is meat and fat. And I may mention here (that up to the day I left Paris, Jan. 29) no fat of any kind had been issued in the ration of the Parisian since December.

The civilian food ration was a matter of grave concern to the hospital authorities, for they depended on it for the hospital supplies, and food shortage in hospital creates many difficulties.

A few days after I left Paris the frost broke and a thaw cleared the streets. If the hard frost had continued the Hôtel-Dieu and other hospitals would have been very hard-pressed to provide for those seeking admission. Paris is overcrowded, and although extra hospital accommodation is needed, it is almost impossible to find. Civil and military needs are pulling in a tug-of-war.

CHILDREN

My next call was on Prof. Robert Debré, of the Paris Faculty of Medicine, at the Hôpital Necker, an 800-bedded hospital for children. The hospital was not overcrowded, for there has not been any great increase of illness among children. Professor Debré told me that infants up to one year get an adequate diet, including milk; but they have suffered from the cold weather and there have been admissions for bronchitis, bronchopneumonia, and otitis. The mortality from these diseases has risen from 6 to 10% because the infants' resistance has been lowered. And this applies even though there is a ration of coal for children under one year. I wondered if everyone got the ration. And I remembered and understood an experience I had had shortly before, when lunching in a private flat. We lunched in a small room leading out of the nursery in which two children slept—one an infant of a few months and the other a baby of 2–3 years old. We lunched in that room because the small stove warming the nursery was the only fire and the only source of heat in the flat. My friend had a good position in the public service and his wife devoted herself to the two infants. I hope all other young babies in Paris were as warm as they were on that day, and as well looked after; but I doubt it.

Professor Debré laid great stress on the lowering of the power of resistance to disease among children and adolescents, but said that there was no increase in infectious diseases. The only notable change with regard to diseases of children was the increase of tuberculosis.

Young people from 6 years of age to 20 did not get enough food—particularly not enough fat. Children and young people were thinner and shorter than they ought to be; they did not reach the normal. And this was particularly evident in boys.

We discussed the difference in health conditions in town and country in France, and Professor Debré agreed that there had been an actual improvement in the health of some rural areas, which he put down to a diminution in cases of alcoholism as well as to the adequate supply of food which food-producers are able to ensure for themselves.

FATIGUE, TUBERCULOSIS, AND ALCOHOLISM

My next visit, to Professor Justin-Besançon, president of the French Red Cross, enabled me to renew a contact I had made with the French Red Cross Societies many years ago. The three societies are now merged in one organisation, which carries on its work on the same lines as formerly, providing help for both military and civilian services. Professor Justin-Besançon spoke particularly of fatigue as a factor adversely affecting the general level of health.

Professor Troisier, of the Faculty of Medicine, whom I saw at his house at Auteuil, drew special attention to the increase of tuberculosis by 25% between 1941 and 1942, and on the increase of tuberculous meningitis. He also referred to the considerable increase in cases of pulmonary tuberculosis in which diagnosis is made by recognition of the tubercle bacillus in the sputum at a tuberculosis dispensary.[2] The number of these cases per 100,000 was 141 in 1938, 161 in 1941, and 176 in 1942. The total population dealt with was 1,759,000 (cases 2590) in 1938, 1,436,000 (cases 2337) in 1941, and 1,397,000 (cases 2451) in 1942. The fall in population in 1941 was due to the war, and despite this fall in density of population the proportion of cases increased. It should be mentioned that the 1938 figure of population is taken from the census return of 1936, and the population figures for 1941 from the records of food ration cards. Professor Troisier thought that there was now a regional amelioration of tuberculosis; but what the relation of that factor is to others in the picture of public health in France is difficult to determine.

The decrease in alcoholism, previously mentioned, is one in which Professor Debré has interested himself, and the facts are of great medical interest. Owing to the war [illegible]

has practically disappeared. Cirrhosis of the liver, polyneuritis, and gastric troubles of alcoholic origin are almost absent from the hospitals of France.

Cases of alcoholism fell steeply in Paris, in Nancy, and at Angers in 1942–43; but in Montpellier, where consumption of wine and spirits was almost unrestricted, they increased greatly between 1939 and 1941.

Taking mortality from cirrhosis of the liver as measure of alcoholism, here are the figures of dea per 100,000 population:

1936	1937	1938	1939	1940	1941	1942
37·1	35·6	34·5	33·3	34·8	35·7	18·6

The improvement in general mortality-rates the war in certain rural areas, such as Norma Brittany, is partly ascribed by some medical o France to a reduction in the consumption of sp the institute says, France during the war has greater experiment on the effects of alcohol tha United States with its system of prohibition.

(*To be concluded*)

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THE DOCTOR DEMOBILISED

FROM OUR CANADIAN CORRESPONDENT

THE problem of "rehabilitation" of medical officers of the Canadian Armed Forces is under consideration and a solution is offered. The unknown quantity is the rate at which these officers will be returned to civilian life.

Early in the war the Government set up a Medical Procurement and Assignment Board to provide doctors for the Forces and to protect the people of Canada by ensuring that no large area should be left medically uncared for. This board has done a good piece of work, and the Forces have been adequately supplied with over 1000 medical officers. Normally there are about 10,000 doctors practising in Canada, but retirements have been deferred and the people are being given almost full service by the 6000 practitioners still available.

To provide a pool of medical officers the nine medical colleges have accelerated their courses so that the work of six academic sessions has been done in 4 calendar years. The students have been enlisted in their fifth academic session and are under control of the military authorities until as graduates they have served a hospital internship of 8 months. They have then been commissioned in the Services.

Thus it is that nearly half the medical officers in the Canadian Forces have never been in private practice. For the purposes of the MPA Board they are classified into six groups according to status at time of enlistment:

1 (*a*) Students graduated in accelerated courses. (*b*) Students graduated before acceleration began and commissioned after internship.
2. Students taking post-graduate courses [illegible] practice.
3. Practitioners less than 5 years in practice.
4. Practitioners between 5 and 10 years [illegible]
5. Practitioners under 40 years of age and [illegible] in practice.
6. Practitioners over 40 years of age.

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[2] Troisier, J. *Bull. Acad. Méd.* May 18 and 25, 1942.

Some time ago Canadian medical officers were given a questionnaire as to their wishes as regards rehabilitation. The first 1800 replies showed that over 90% of the men and women wanted a period of graduate study before entering or resuming practice. The time asked for varied. Of 1633 people who wanted a term of postgraduate work, 10·4% asked for a period up to six months, 21·1% from six to twelve months, 22·8% one to two years, 14·2% two to three years, 5·1% three to four years, 1·9% four to five years, and 0·3% five years. The remainder did not specify the length of time desired.

The question as to where it was desired that this time be spent was answered as Canada 32·2%, United States 19·8%, and Great Britain 6·8%. The remainder made no choice.

A survey has been made of the facilities available in Canada to satisfy the demand implied in the response to the questionnaire. The Canadian medical schools and hospitals are prepared to take care of a maximum of 1200 postgraduate students a year. This will mean that centres with large hospitals not connected with any college will be assigned part of the work. For instance the Civic Hospital in Ottawa, with 900 beds and a very competent staff, could provide for 25 to 40 or more. Just now they are getting along with 8 interns!

The Government is prepared to finance postgraduate training in a very liberal manner. A committee repre- nting the universities, the Royal College of Physicians o Surgeons, and the Canadian Medical Association the be in charge of the situation. The Medical Pro- Côte ent and Assignment Board will continue to function Puy-d advisory boards in every Province. All officers Thus s 1 and 2 in the schedule will be eligible, and the urban aill be given liberal consideration on application. the Med men will be paid $80 a month with allowances incidenc en, and single men $60. The Government will But arou es for tuition and all moneys thus paid will be the rural x. *Those officers not willing to spend time in* ate study will receive a grant in money instead food is hefits given those who accept the opportunity. before th provision is made for rehabilitation loans up to 3% interest repayable within 12 years. Depend- length of service and other factors, medical The may receive $7000–10,000, with 60% of the sum partly ile.

The United States will have 50,000 of its own officers seeking graduate training, so there is scant hope of any Canadian sharing in the facilities of that country. Probably Great Britain will be equally inaccessible. Should demobilisation be complete at the close of the war, all Canadian officers could not find opportunity in Canada; but medical services will be required long after the troops return, for every man is to be "boarded." The 1200 places per year will probably provide every demobilised medical officer with the opportunity he desires.

MASS RADIOGRAPHY IN ACTION

A NEW method in diagnosis needs thorough and careful trial before it can be used to best advantage. In a guide[1] to administration and technique with a mobile miniature radiography (MR) apparatus the Medical Research Council have provided a model for subsequent investigations, and include a survey of results which drives home the lessons of other radiographic surveys made in recent years.

Those responsible for the report are Miss Kathleen C. Clark, FSR, Dr. P. D'Arcy Hart, Dr. Peter Kerley, and Dr. Brian C. Thompson. A description of procedure, occupying about half the report, gives details of every step in the investigation, including specimen letters to those who are to be examined, record and statistical cards, record books, and lists of requirements, with a full account of the apparatus used, the personnel needed, and the management of groups of examinees. Samples of radiograms are included. Emphasis is rightly laid on the confidential nature of the examination, and the importance of not notifying the firm, or even the firm's medical officer, of the results except with consent of the patient. The authors are responsible for training other MR teams at the London School of Hygiene and Tropical Medicine, and this first half of the report might well serve as a manual. of the shortage of MR units, however, it is as yet only possible to demonstrate the value of the method: a nation-wide survey is beyond our means.

RESULTS

The second half of the report, which deals with results, has an interest for the whole profession and should be widely read. Four groups of people in the Greater London area were examined. They included workers in two factories (group A 4720 people, group B 5657), an office group (10,903), and patients (1564) and staff (198) in a mental hospital. Except in the case of the mental patients attendance for X-ray examination was voluntary, and the report demonstrates how much the response depends on methods of approach. Thus at factory A 90% of employees available during the inquiry accepted examination; at factory B only 39%. Many factors may have been responsible for this, but the investigators note what they hold to be the most important.

> At factory A the shop stewards and supervisory staff had discussed the proposal fully with the medical director of the unit, and the factory medical department took a full part in the publicity; a keen woman medical officer gave talks to groups of workers and the sister in the department visited the shops to collect volunteers and to arrange the times of their appointments. A list of the names of employees was supplied to the unit, for checking.
>
> At factory B preliminary discussions were less complete and fewer members of the factory staff attended them; publicity was less thorough, employees were left to volunteer on their own initiative, and no list of names was supplied. A severe influenza epidemic at the time may have contributed, but allowances had been made for recorded absences during the survey, so this should not have affected the percentage figure, which was calculated on the staff available on the day of examination.

The results tallied well with those of nine other surveys made in Great Britain during war-time, and like them reveal an incidence of lesions requiring treatment which is startling when considered in relation to available beds.

> In the two factories and the office the proportions recalled for full-size films were 5·5%, 6·3%, and 5·1%. These of course included people with non-tuberculous as well as tuberculous lesions. The total incidence of newly-discovered tuberculous lesions ranged from 1·1 to 1·6%, and the percentage needing treatment from 0·3 to 0·4. The rest needed careful observation checked at intervals by radiography. *The incidence of total cases tended to increase with age in the men, and to decrease in the women. Thus, as common experience shows,* women supply most of the cases in young people, and men most of the cases in older people.

IMPLICATIONS

These findings suggest an immediate need for 3 sanatorium beds per 1000 of adult working population and dispensary service for over 10 per 1000. This should not on any account lead to an ostrich-like postponement of surveys. It would be inept and feeble to say that because we lack beds to put them in we l better not look for the cases. On the contrary, i rather our duty to discover the total numbers of th early cases in order that we may recognise the extent of our commitments and hasten to meet th It is noteworthy that, as the report shows, many peo with *lesions serious enough to need treatment have* symptoms. Moreover we have still much to le about the course of cases in which the lesions are mini and symptoms absent.

Besides newly-discovered cases, there were 0·4% cases previously diagnosed as pulmonary tubercul in both factories A and B, and 0·2% in the office gro Some of these were under medical care, but other perhaps because they had moved from one district another, or for some other reason—were under supervision. That considerable numbers of peo known to have pulmonary tuberculosis are at wo and that no special provision has been made to safegu either them or their fellow workers, in itself deser grave consideration.

The morbidity in the single mental hospital inve gated was high among patients—3·5% *of newly-* covered significant lesions and 1·3% of cases need treatment. The mortality-rate from tuberculosis

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[1] iniature Radiography of Civilians. *Spec. Rep. Ser. med. Coun., Lond.* No. 251. HMSO. Pp. 135. 3s.

5 to 10 times as great in mental hospitals as in the ordinary population even before the war, and the present figures, regrettable as they are, might have been expected. They are a measure of the defects of our many antiquated, overcrowded, and understaffed mental hospitals, and should in themselves prove a spur to reform. The report notes that the hospital in question was one showing a high order [illegible] so we may suppose that i[illegible] would have been worse. T[illegible] suggest that local authorities owning several mental hospitals might find it worth while to build a tuberculosis hospital for mental patients, thus reducing the risks to other mental patients and providing better treatment for those who are tuberculous.

Dealing as it does with civilian groups the survey cannot be compared directly with those made on Service personnel, where methods of classifying cases have been somewhat different, and where those examined had already been "selected" by medical examination. In so far as the figures are comparable the incidence of sitive cases in two RAF surveys were lower than in is report; in a Naval survey in 1940–42, the incidence was so lower, but in a survey made since the figures had sen to levels more similar to those in the MRC survey. The methods set out in this report would prove luable in liberated countries and among the many isplaced people in Germany. Tuberculosis has certainly increased in Europe though exact figures are not nown. Surveys on a limited scale would enable the governments concerned to assess the extent of their problem and prepare their tuberculosis programmes accordingly.

BRITISH COUNCIL FOR REHABILITATION

THIS organisation, whose formation we announced ast week, has among its objects:

> To act as a central coördinating body for the various interests concerned in the widest aspects of rehabilitation.
>
> To promote and correlate courses of study in rehabilitation.
>
> To invite the active coöperation of Government departments, hospitals, universities, training colleges, educational institutions, and research foundations in promoting the study and practice of rehabilitation.
>
> To secure the active cooperation and participation of commerce, industry, and professional bodies in the problems of resettlement.
>
> To encourage the formation of follow-up schemes for the rehabilitated.

The Council is to consist of two representatives from each of the member organisations, together with members elected by the Council (whose number must not exceed half the number of representative members) and two delegate members from each of any regional councils that the Council may establish. The member organisations and elected members at present are:

Member organisations.—Association of Occupational Therapists, British Federation of Social Workers, British Legion, British M[illegible] for Insurance Nur[illegible] of Cripples, Un[illegible] Association, Ind[illegible] for the Blind, National Institute for the [illegible] Centre, St. Dunstan's, the [illegible] the Royal College of Nur[illegible] Industrial Welfare of Tuberculous Persons.

Elected members.—Dame Georgiana Buller, Mr. St. J. D. Buxton, FRCS, Mr. Norman Capener, FRCS, Dr. F. S. Cooksey, Mr. Victor Dover, FCII, Mr. E. S. Evans, FRCS, Mr. H. E. Griffiths, FRCS, Mr S. L. Higgs, FRCS, Dr. Horace Joules, Prof. J. M. Mackintosh, FRCP, Mr. S. A. S. Malkin, FRCSE, Dr. Donald Norris, and Mr. R. W. Watson-Jones, FRCS.

Lord Rushcliffe is chairman of the Council, and the executive committee are:

> Mr. Griffiths (chairman), Dame Georgiana Buller (vice-chairman), Sir Brunel Cohen, Mr. Evans, Alderman N. [illegible], Dr. F. R. G. Heaf, Dr. J. A. L. Vaughan Jones, Miss W. M. McAllister, Dr. Norris, Dr. Cooksey, Mr. W. Scott Evans, Miss E. L. Beckett, Mr. W. P. Allen, and Mr. J. [illegible] Jones.

Mr. H. Vezey Strong is the hon treasurer, Miss D. A. Fraser is the secretary, and the address of the Council is 32, Shaftesbury Avenue, London, W1.

In England Now

A Running Commentary by Peripatetic Correspondents

THOSE who have been inclined to think of Guy's as a stronghold of die-hard misogyny would be surprised to see the medical school today. Women medical students and their lady professors rub shoulders with the men. They use the same physiological laboratories, perform the same experiments, occupy the same lecture theatres, and take part in the men's debates. No recommendation of an interdepartmental committee, no lure of a university grant has brought this about, but the "common enemy"; for these are pre-clinical students from a women's institution in Southern England whose [illegible] temporarily uncomfortable [illegible] an English winter. Nor [illegible] [illegible]ting officer required to enforce this mixture of the sexes. A genuine desire to offer hospitality to colleagues was the only motive. The girls were not greeted with the defiant resignation of the first-class corner-seat passenger when a party "en famille" invades his self-conceived sanctity. Rather did everyone beam benevolently upon them like so many contented uncles who have just experienced the smug [illegible] [illegible]ight new half-crown piece. [illegible] not however altogether [illegible]me. Never again is Guy's [illegible]ch strength, for when the Real Thing comes each school will be required to take only a small quota of women, and the quantitative inferiority will give them an uphill fight to achieve qualitative superiority. Nor will they then be visitors. Today's spectacle recalls the meetings at Guy's of the Physiological Society in the days of Professor Pembrey. The high spot of the afternoon would be the box of chocolates which the great man himself would proffer to each of the ladies in turn. This compliment was not even marred by "[illegible] uttered in those characteri[illegible] ch delicate hand hung poi[illegible] two each, remember!"

Poor young ladies! It'll be "No chocolates for Miss Medico," in those postwar Goodenough days. On the whole I think I would avoid co-education and prefer to compete solely with my own sex were I a young woman with medical ambitions.

* * *

Those American nurses, so maturely outspoken and so dapper, have always seemed to me to shine a new lamp up the road along which our own nursing service should [illegible] many don't want to serve in the Army. According to the Surgeon General at Washington the shortage there is critical.

> "Since last October," he complains, "the Army Medical Department has been stressing the need for 10,000 additional nurses. We sent a personal appeal to each one of the 27,000 nurses that the War Manpower Commission told us were available for duty. Our returns from that appeal were pitiful. We received 760 answers and signed up 227 nurses from that group."

As a result Mr. Roosevelt has asked that the Selective Service Act be amended to provide for the induction of nurses into the armed forces. In this country we are almost resigned to not having enough nurses to go round; and my friend the Enlightened Senior Nurse, who is the despair of her contemporaries, says it all comes of spreading their training over four years. Using modern teaching methods, she says, you could perfectly well train an intelligent girl as a nurse in two years, provided you didn't waste her time and blight her enthusiasm by making her do ward-cleaning and message-running for the first two. Girls (so she says) like nursing, they come into the hospitals all agog to nurse; but for [illegible] they are not allowed to perform any serious [illegible] service for the patients, and they lose their [illegible] velocity. The four-year course, she [illegible] uncompromising way, is a device of the [illegible] staff; but if girls could qualify in two [illegible] would be willing to try nursing; they [illegible] and rightly, by the thought of four years' [illegible]. If the course was shorter some girls might even be willing to take a nursing course as a preliminary to marriage; and that might lead to a revival of the old custom (which I personally favour) of getting born, and being ill, and recovering or dying, as the case turns out, in your own bed—a process which should relieve the pressure on hospitals.

I know this is not orthodox. I am suggesting, I know, that we should let loose a lot of half-baked specialists on the community. But a half-baked nurse may also be a half-baked cook, dressmaker, and handymaid—a thoroughly all-round person in fact, worth more than nine out of ten fully-baked specialists. It is all this thorough baking, if I may use the expression, which has browned me off.

* * *

Why stretch the Septuagenarian out flat on a crib 6 × 2 ft. when he is ill or feeble? He certainly isn't happy or comfortable on it and these are the two first requisites of recovery in old age. Women seem to feel differently about it, but then they like bed to read in. Who ever met an old man asking to go to bed! Like the cony he feels the cold if he is spread out. And in bed at best he can only get an even temperature, whereas what the old man craves is radiant heat. The two inspired civil servants who drew up the first coal-rationing scheme had the right idea when they pleaded to let the old man change some of his clothing coupons for extra fuel. All the old man's processes go on more naturally in the sitting position—circulation, digestion, sleep itself, which most old people find refreshing out of bed—and the acts of nature are simplified. It should be possible to devise a toilet settee on to which he could gently slide: what a vista of happiness for those who have the daily bedpan torture to look forward to. I am no technician, but I fancy that the box-spring would be the most comfortable groundwork for the settee and would compare favourably in cost and durability with other materials. Initial cost of the settee would no doubt be considerable, which is a reason for considering it betimes along with the rest of the provision for housing the old which we are now facing. Let us make no mistake at the outset about the type of equipment that is best for them.

* * *

Our medical school has suffered its third and worst bombing. Some time ago a bomb nearly hit the building and blasted off one wall, putting all the laboratories out of action. Not a window, and hardly a door, remains intact, though already library, refectory, and common-rooms are again in use, and the office functioned throughout. There were no fatal casualties and the students, aided by all sections of the staff, have since cleared the place of masonry, rubble, and glass, and have salvaged and cleaned apparatus. They also carried down four flights of stairs (no lift being available) 12 heavy teak dissecting-tables, 100 stools, and 10 "subjects" in coffins. To the alarm of bystanders these were loaded by instalments into the only available transport, a one-horse van, and transported to Another Place, where 92 students resumed their dissections by 9 AM on the fourth day. Laboratory facilities for physiology were afforded elsewhere, and work there was begun on the same morning; and a few days later first-year classes also were in full swing. All of us are deeply grateful for the prompt, generous, and friendly hospitality afforded, and also for the kind offers which we could not accept.

* * *

Here is a letter from a parent to excuse the non-attendance of his son at our refraction clinic.

> SIR,—I am not allowing my son, Norman, to come to you for eye treatment, the reason being the ointment or drops you have given for his eyes has had definitely a detrimental effect. After the first application he complained of not being able to see properly. Thinking that this was perhaps an evasion, I tried some in mine, I have lost in one eye my vision, which was, I was assured at the Eye Infirmary, very good. If my eye does not improve, or the boy's, I intend to have expert advice. I, as a layman, fail to see why vision should be made worse, to have one's eyes tested.—I am, &c.

I should explain that we do warn patients of the effect [illegible] use of the mydriatic when it is issued.

Letters to the Editor

RETURN TO CIVILIAN MEDICINE

SIR,—My son has been a medical [illegible] Germany since Dunkirk, working in [illegible] hospital where Allied airmen are tre[illegible] views on the re-education of Service medical officers for civil life, and in reply he tells me that the following conclusions have been reached by the staff of the two hospitals with which he is connected:

1. *Young MO's* should have 3–6 months lectures covering the main subjects of the final-year [illegible] obstetrics, gynæcology, and [illegible] on the common maladies use[illegible] tioner, and little of biochemistry and pathological rarities. Also a course in therapeutics given by a clinician. The greatest possible use should be made of beds and outpatients for demonstration purposes concurrently. (Use municipal beds.) The course should be free (compare Dominions) and it should be followed by facilities for house-appointments, with preference over the rising generation, and some State aid for those with families.
2. The *older GP* should have a short [illegible] in the diagnosis and treatment [illegible] with obstetrics and gynæcology.
3. The *specialists* mostly want 3–6 months' facilities and financial assistance for study in their own specialty, and some ask for 3 months in the United States. The embryo specialists need the same assistance to read for MRCP, or the primary or final fellowship of the RCS. This may sound grasping, but the Dominions are doing all this—see published schemes of New Zealand, Australia, and Canada

He adds that "all the above categories are represen with us here, and all seem to be impressed with the n for financial aid, of which the war gratuity would fo a part."

MD

*** On another page our Canadian correspond describes the Canadian proposals.—ED. L

MENINGITIS FOLLOWING SPINAL ANÆSTHES

SIR,—The medical profession is indebted to Frankis Evans for his paper of Jan. 27 reporting t cases of meningitis following spinal anæsthesia and a for outlining the technique to avoid a recurrence. Ma surgeons who gave spinal anæsthetics themselves in t early days have solved the problem of sterility, but so anæsthetists have need to realise the importance adequate scrubbing-up and minimum touch. Son in preparing to give a spinal anæsthetic, merely dr back their cuffs, wash for a matter of seconds, and ev keep on the ring that they may be wearing; in oth words, they need to learn how to scrub up.

In these days of many and varied methods of ana thesia, such as intra- and extra-dural administratio local and regional infiltrations, and posterior splanchni a high degree of technical skill and asepsis is requir of the all-round anæsthetist. Dr. Frankis Evan article may well be the precursor of an extra conditi for candidates for the DA—that besides having held resident anæsthetist's post they shall have been hou surgeon at a recognised hospital.

In 1935 I had the mortification of losing a patient fro meningitis after a spinal anæsthetic. Since then ever thing connected with the spinal anæsthetic has be boiled in a separate electric steriliser containing distill water: this includes needles, syringes, and the ampoul of 'Nupercaine.' The materials are then all laid dry. Nine times out of ten, so-called sterile water infected; and bacteriologists tell us that there is nothi so good as a wet surface for attracting and spreadi infection. Syringes are washed out if necessary—but wi some of the anæsthetic agent, out of the boiled ampoul

With the fine needles now used, preliminary infiltrati of the skin with procaine is unnecessary; but should be considered advisable, then some of the nupercain amethocaine, or procaine which will be used for the spin can be injected.

Each year an appreciable number of people in th country die "respectably" from rinsing instrument in so-called sterile water, or from the use of instrument after being "sterilised" in spirit. I personally seen such a case, and I have heard of more deaths and cases of cellulitis of the arm than I care to recall. It will be a happy day for the British public when we in the medical profession succeed in discontinuing the use of sterile water (except out of ampoules) and of spirit for sterilisation. Spirit is a good preservative of germs; yet both the medical and nursing professions hold on to it faithfully for storage of instruments—a costly fidelity.

The essentials for spinal anæsthesia are to boil everything—needles, syringes, and ampoules—and lay up dry. The area must be towelled adequately with a sterile towel. The lumbar area must be properly prepared. And finally, the administrator must wash up to the elbows for 4–5 minutes and touch as little as possible.

London, W1. **HAROLD DODD.**

SIR,—Any help in preventing the tragedy of the infected spinal injection must be welcome to surgeons and anæsthetists, but I fear that the advice given by [illegible] this admirable form of analgesia. In brief, the operation consists in the transference of fluid from an ampoule, via the sterile interior of syringe and needle, into the patient's meninges, and the fewer extraneous solutions (such as reputedly sterile saline, and fluid of any sort from a rubber-capped bottle) that touch these vital channels, the better. In my opinion there are four essential rules:

To boil syringe and needle immediately before use.

To wash out the syringe with a little of the anæsthetic solution which is to be injected. The interior of the needle will be irrigated by emerging cerebrospinal fluid when the puncture is made.

To hold the spinal needle in a gauze swab.

To make a preliminary skin puncture with any large serum needle, thus preventing a lump of epidermis becoming impaled upon the spinal stilette.

Other [illegible] are useful accessories, but if these [illegible]nts are observed there need be no [illegible] spinal analgesia under any conditions [illegible]urgery at all.

[illegible]BIA. **W. G. MILLS.**

STRESS FRACTURES OF THE FIRST RIB

SIR,—May I briefly answer the criticism of my paper made by Dr. Blair Hartley in your issue of Jan. 27?

Firstly, my study was based on radiography and personal interrogation of the subjects: Arbuthnot Lane had the advantage of me, as of course none of my cases has as yet come to post-mortem! Secondly, although only 35 cases in a series of 55,151 consecutive fluorograms were recorded, I stated that "not infrequently first ribs were noted to be broadened or to show some departure from the normal architecture near the scalene tubercle"—the site of the undoubted lesion. These cases, had they been recognised and recorded earlier, would surely have increased the incidence of fracture of the first [illegible] to a consi[illegible] are nece[illegible] from A[illegible] recorde[illegible] [illegible] of my [illegible] cases was any history of direct injury obtained, and of these one was so vague as to be of little value.

Hartley's main objection is to my use of the word "stress." I feel certain he does not deny the presence of fracture. Further research into the antecedent history of another 29 cases in my next 26,231 consecutive fluorograms, not one of which even under pressure admitted direct injury, satisfies me that the use of the word "stress," is likely in the majority of cases to be justified. In applying the criteria formulated by Hartley, taking both series of cases, 64 in all, (1) the affected ribs were apparently normal in all other respects, with one possible exception, and no obvious associated congenital abnormality was recorded in the thoracic cage; (2) only 2 cases can be ruled out on the score of direct injury; (3) "sub threshold stress" is difficult of definition and is very personal, especially when applied to an anatomical mechanism not constantly weight-bearing, or at least not so constantly as the pelvis and lower extremities. [illegible] time [illegible] exposed from time to time [illegible] lifting [illegible] particular heavy weight-[illegible] less than 6 of the later series of 29 cases give a definite history of lifting and carrying weights of 1 cwt. and over, while one of them was employed for several years in a flour mill carrying 2 cwt. bags of wheat, but whether this can be regarded as a sub-[illegible]

In [illegible] in the [illegible]actures can occur than [illegible] apparent reason [illegible] stress, and this is not in doubt, there would appear to be no reason to suppose that a similar condition, especially in the almost monotonous absence of history of injury, is unlikely in the first rib when it is subjected to heavy weight-lifting or for that matter, to any other unaccustomed physical exertion over varying periods of time affecting the shoulder girdle and thereby the first rib.

Chatham. **B. ROXBY ALDERSON.**

BRACHIAL NEURITIS OR HERNIATED DISC

SIR,—In your issue of Jan. 6 M[illegible] lucidly describe a type of br[illegible] C7 root, and bring forward fairly convincing evidence that it is due to compression of the root by a laterally-placed protrusion of the intervertebral disc between C6 and C7. In the past [illegible] patients suffering [illegible] have seen 20 [illegible] be a common type [illegible] it appears to [illegible]mong Service personnel in this country. All the patients were men except one who was a nursing sister.

The outcome in these 20 cases may be of interest. The acute pain radiating down the arm stopped within five weeks in 16 cases, and within six weeks in 1. In 2 cases there was still pain of decreasing severity after five weeks when they had to be transferred to other hospitals, and 1 patient [illegible] he [illegible]re pain after nine weeks when pa[illegible] Service. When the severe [illegible] still be a minor degree of disability; occasional dull aches in the arm may occur, some weakness of the triceps may persist for some weeks, and dysæsthesia in the index finger may continue for several months. The triceps-jerk can certainly remain absent for many months, and it seems possible that it may remain absent permanently—a finding comparable to the loss of the ankle-jerk in radicular sciatica due to a prolapsed disc or other cause, which may be absent many years after the sciatic pain has stopped. No case of a second attack of severe pain has yet been seen.

These results, without special treatment other than mild analgesics and in the more severe cases rest on the lines described by Elliott and Kremer, suggest that the prognosis of the condition is good and that operative removal of the disc protrusion should very rarely be necessary. The last line of your annotation on the subject (p. 21) is very true.

J. W. ALDREN TURNER.

EXUDATIVE TONSILLITIS

SIR,—The diagnosis of diph[illegible] cannot [illegible] e inoculated [illegible] is a positive [illegible] my paper, the *state of immunity* of the [illegible]agnosis. As I [illegible] patient has to be ascertained, by a Schick test or by an estimation of the antitoxin content in the blood.

In the series of 50 cases which I published, the throat lesion varied between minute spots and large deposits covering the whole tonsil, but virulent diphtheria bacillus and no other organism was found in the throat, and the Schick test was positive in all. The diagnosis of diphtheria cannot be doubted. It is obviously wrong to accept the diagnosis only in those cases which exhibited a severe throat lesion and to repudiate it in those with a small deposit. If the criteria [illegible] observed it [illegible] is very rare [illegible] inoculated [illegible]

Newcastle-upon-Tyne. **C. NEUBAUER.**

REORGANISATION OF THE TUBERCULOSIS SERVICE

SIR,—The report recently issued by the Joint Tuberculosis Council makes a number of excellent recommendations, including the formation of joint boards by small local authorities for tuberculosis services; improvements in the system of notification; closer association of tuberculosis officers and their clinics with the general hospitals; and coördination of the tuberculosis with other public health services in the locality. But there are some serious omissions. In three pages of recommendations, no suggestion is made that social welfare workers—almoners—should be appointed to local services; the education of the general public on tuberculosis is not discussed, nor are problems of staffing sanatoriums with nurses and domestic staff, and of health protection of staff. The report is equally silent about the part to be played in teaching and research by existing or future university departments of tuberculosis or thoracic medicine, the problem of contact examination (so defective at present), and the relation of the tuberculosis service to the industrial medical services in relation to re-employment. Finally, there is no allusion to the future of the nation-wide mass radiography scheme, nor to the financial allowances scheme. The council's views would be particularly valuable on methods of integrating mass radiography with the rest of the service. Their last publication on this subject was in 1941, two years before the scheme was started.

OBSERVER.

CECIL JOLL MEMORIAL FUND

SIR,—We, colleagues and friends of the late Cecil Joll, feel that some recognition of his distinction in the science and practice of surgery should be put on permanent record. This, we suggest, might take the form of an annual lecture or prize essay sponsored by the Royal College of Surgeons of England, as shall be determined by the president and the council, of which Cecil Joll was an active member.

Contributions from all those in sympathy with this object should be sent to the Manager, National Provincial Bank, Marylebone High Street, London, W1, marked "Cecil Joll Memorial Fund."

ELIZABETH BOLTON
DANIEL T. DAVIES
HORDER
JENNER HOSKIN
CEDRIC LANE-ROBERTS.
LIONEL E. C. NORBURY

A CHAIR OF PSYCHIATRY

SIR,—The letter of "Service Psychiatrist" in your issue of Feb. 17 raises two important questions. One of these chiefly concerns psychiatrists; the other interests all Service medical officers overseas.

The blinkered outlook revealed by the Goodenough report in its section on psychiatry, and the inadequacy of the policy which it suggests, have caused some dismay to Service psychiatrists overseas, many of whom have by the nature of their work been made to realise with special vividness the need for a well-balanced development of psychiatry after the war. The impending appointment to the University of London chair of psychiatry is of considerable importance in this connexion, and the appointment should therefore be open to the widest possible field of candidates.

A larger issue also arises. The increasing tendency to fill permanent medical positions at home now, while so many of our colleagues are on foreign service, is causing growing concern overseas. In total war danger, discomfort and overwork are, to some extent, shared by all doctors; but it is those on overseas service who have the most grievous burden to bear—separation for periods of years from family and homeland. It is clear that this burden would be more evenly distributed if all fit doctors at present working in the Emergency Medical Service or other civilian employment took their turn of duty with the Armed Forces. Doubtless the possibilities of this proposal are being explored. Meanwhile, at least the making of permanent medical appointments now should be reduced to the absolute minimum. Otherwise resentment will increasingly develop among medical officers overseas, who naturally experience in a rather more acute degree the concern which many of us feel about our professional opportunities after the war.

In discussions about the future of the medical services in this country after the war, the interests of doctors serving overseas have often been piously invoked. The question of the making of permanent appointments is likely to be regarded by medical officers on foreign service as a test of sincerity in the councils of our profession; and the maintenance of "equality of opportunity" in this matter would materially aid cohesion of the profession after the war. It might even help to get the best medical men into the right post-war jobs.

S. A. MACKEITH,
Formerly Adviser in Psychiatry,
Allied Force Headquarters.
London, SW1.

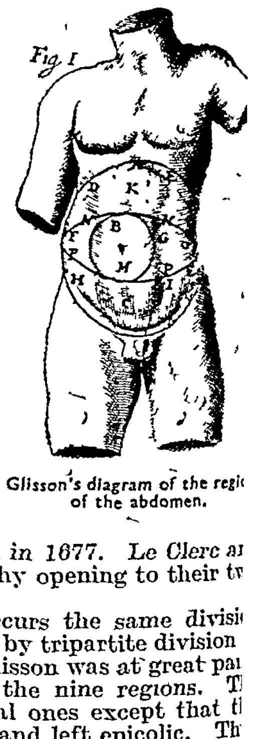
SIR,—I trust that those responsible for filling the London chair of psychiatry will bear in mind the positive advantages that might be secured by appointing a Service psychiatrist. By general consent, the psychiatric work carried out in the Services has been excellent, and the new viewpoint in extramural psychiatry wi have much to contribute to post-war social medicin if sponsored by a man with administrative experien of its advantages and limitations.

EMS PSYCHIATRIST.

ABDOMINAL TOPOGRAPHY

SIR,—In their instructive article of Jan. 6 (p. 1 Brown and Smith rightly call attention to the confusi that exists in modern textbooks. They support Willia Anderson, who, in 1892, ascribed the division of th linea alba into three equal parts to le Clerc in his *Epitome of Surgery*, published in English in 1696.

Daniel le Clerc (1652–1728), a practising Swiss physician born at Geneva, published the famous *Bibliotheca Anatomica* at Geneva in 1685, two volumes in folio. As joint editor with le Clerc was Jean Jacques Manget (1652–1742), a most laborious biographer. This compendium consists of a wide selection from the works of the outstanding anatomists of the 17th century, and appropriately starts the anatomical scene with Françis Glisson, Regius Professor of Physic in Cambridge: "Tractatus de partibus continentibus in genere et in specie de iis abdominis." This treatise had been previously printed in Amsterdam in 1676 and in London in 1677. Le Clerc a Manget seized upon it as a worthy opening to their tw tomes.



Glisson's diagram of the regi of the abdomen.

In this article by Glisson occurs the same divisi of the abdomen into three zones by tripartite division the linea alba (tab. I, fig. 1). Glisson was at great pa to describe by line and letter the nine regions. T names used are the conventional ones except that th lumbar regions are called right and left epicolic. Th Brown and Smith are in good company in insisting the retention of the umbilical region. Embryologicall the umbilicus is the scene of many happenings, and, aft all, as Ballantyne said, it is the mouth of the embryo a of the fœtus.

Anatomy School,
University of Cambridge.
H. A. HARRIS.

PÆDIATRICS OR CHILD HEALTH?

SIR,—I write to put in a plea for the retention of th words "pæditrician" and "pædiatrics." I do so chief because these designations have long been established the universities and hospitals of North and South Ameri and of Europe. When travelling abroad one realises ho important it is for us to keep into line with the rest of th world, so as not to expose our teachers and practitione to the disadvantage of being called by titles which diff from, and often hold a little less dignity than, tho of their colleagues. The public, and especially elective bodies, are now beginning to understand what pædiatrician is, just as they have come to know what a psychiatrist and a [illegible]

The term "ch[illegible]onable, is a little like a catch-[illegible]omposition. Furthermore it does not obviously include infants—a point which those connected with maternity hospitals and infant-welfare centres should note. There is every reason for including in our title the idea of health as well as that of disease, but we should not go too far in our enthusiasm; actually pædiatricians have long based their work on this idea. I suggest therefore that we call the holders of our chairs professors of child health and pædiatrics, or of pædiatrics and child health.

Manchester. C. P. LAPAGE.

ANIMAL LIFE IN DESERTS

SIR,—Any discussion of (climatic) heat leaves most people in England cold; but recent articles show that interest is reviving. The subject is of more than [illegible]erest to persons living or serving in sunny [illegible]s Persia, Iraq, India, or Burma where the [illegible]lant men is now beginning to gain a modest [illegible]ublic ear.

[illegible] of heat radiation will be most revealing [illegible] the technique described by Evans and Mendelssohn[1] [illegible]ving conditions when heat [illegible] walls, cloudy skies, vege[illegible]d industrial plant. The ordinary dry-bulb shade thermometer in a meteorological Stevenson's screen is notoriously misleading as a guide [illegible] and [illegible] the [illegible]tive index of "heat effects" as I showed in 1937[3] and previously. The high blood-urea in normal persons is a commonplace. Loss of body-weight in hot weather is confined to certain individuals: if the experimental group had been larger and had contained well-acclimatised subjects, some cases of gain in body-weight in hot weather would have been recorded. Such cases develop an œdematous "hump" to keep them going between drinks of water, the excess body-weight disappearing with the onset of cool weather. A striking feature of heat exhaustion is the stuporose mental reaction; such patients answer questions at random and appear to grudge—or are unable to afford—the mental effort required for a correct reply. After two or three days' bed rest (they are drowsy most of the time but will take light meals with plenty of water and salt) the patient brightens up and will answer questions willingly, even eagerly, and give a full and accurate history up to the time of his collapse. A cool room for treatment is essential. Lad[illegible] was no reason f[illegible] he was lazy a[illegible] inclinations are no guide to the amount of water necessary. I have often examined dehydrated and salt-lacking men who, in reply to the question, "Why didn't you drink more water?" said "I did not feel the need for it." It is necessary for a man to drink from 12 to 30 pints of water a day to keep in balance, and of course consume equivalent quantities of salt. An unphysiological effort is required, and complaints of acute dyspepsia, attributed to the great volumes of water, are common. There is little doubt that the gastric symptoms are due to the water, but there is no other physiological route for water absorption in man.

Ladell, Waterlow, and Hudson advise that men in hot climates should be given a holiday after 8 weeks of hot weather. This policy was actually carried out by the Royal Navy during the war of 1914–18, when they had gunboats on the Tigris; their health resort was in the heights above Colombo, and the results were excellent. No other organisation has had the foresight to provide such reviving spells. No doubt effective air-conditioning would be an efficient remedy, but here again few authorities can overcome the inherent inertia which opposes the [illegible]ption of a new idea.

The division of cases of heat exhaustion into types I [illegible] very interesting, and [illegible] Wallace and Bushby[4] [illegible]eir cases of therapeutic hyperthermia. I have used oxygen inhalation, for preference through an improved BLB mask, with success. Jaundice in cases of hyperthermia has been observed during this war but very rarely in peace-time: it seems to develop in unacclimatised persons (the liver is the hottest part of the body) and is probably influenced by vitamin deficiency and an unbalanced diet. The problem of central [illegible] deficiencie[illegible] acquired [illegible] men destined for service in the tropics, the necessity for careful acclimatisation of such men before exposure to the most severe heat, and the necessity for air-conditioned quarters, hospitals, and laboratories in centres where men congregate for work or war service in hot countries.

A mild attack of so-called sandfly fever, abortive atypical attacks of paratyphoid or typhoid fever (com-[illegible] [illegible]vailable to the sufferer.

FRANK MARSH,
Pathologist, Anglo-Iranian Oil Co., Persia.

RETURN OF BLOOD TO THE HEART

SIR,—In Dr. Roberts's paper of Feb. 17 I was particularly interested in the section on venous valves. I feel that if the "muscle pump" theory is to be questioned, the precise functions of the venous valves should be agreed upon.

Dr. Roberts points out that Harvey stipulated that the valves exist to ensure that blood entering a main channel from a tributary must move towards the heart, and that the valves have nothing to do with gravity. This statement is supported by the anatomical distribution of the valves, which in the extremities are usually found just distal to where a tributary joins a main trunk. This distribution is far more abundant in the extremities than elsewhere in the body, not because of the requirements of gravity but in order that the flow will be in one direction. For it is in these parts that *centrifugal forces* may come to have bearing on the venous return, and if the veins were devoid of valves, back-*flow and* venous *collapse* would undoubtedly occur.

Another example is seen in the veins of the neck, where the valves are usually situated at the inferior end of all veins *running* down into the large venous channels just above the right heart. The external jugular vein has a pair of valves where it enters the subclavian, and another *pair* about 1½ in. above the clavicle. The internal jugular vein has no valves in the base of the neck, *but it has* a pair just cephalad to the inferior bulb. Where the vertebral enters the innominate a pair of valves guard the entrance, as in the case of all other *small veins in this region*. Thus any back-pressure waves resulting from auricular systole will be dissipated and continuity of one-way flow ensured.

I have cited two examples of the functions of venous valves in support of Dr. Roberts's view that they play no part in the return of blood to the heart, when used together with the muscles to form the "muscle pump." Further, these two examples show that a very *important function* of the valves, if not their most important function, is to ensure, together with other factors, that a one-way flow of venous blood back to the *heart* will take *place* irrespective of muscular contraction.

St. Mary's Hospital Medical
School, London, W 2.

G. H. BULOW.

SIR,—As a preliminary to an intravenous injection, it is customary to apply a tourniquet to the upper arm at a pressure above the venous and below the arterial. If from this alone the veins do not stand out well, one instructs the patient to *clench* and unclench his fist four or five times, whereupon the veins become further distended. (To clench [illegible] as patients sometimes do on their own account or on a nurse's instructions. does not have the same effect.)

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[1] Evans, [illegible], Mendelssohn, K. *Brit. med. J.* 1944, ii, 811.
[2] Ladell, W. S. S., Waterlow, J. C., Hudson, M. F. *Lancet*, 1944, ii, 491, 527.
[3] Marsh, F. British Encyclopædia of Medical Practice, 1937, [illegible]
[4] Wallace, J., Bushby [illegible]
[5] [illegible] (complete in [illegible]) J. Amer. med. [illegible] J. 1937, i, 72 [illegible]

This fact, so familiar to all house-physicians, is fully explained by "the theory of the pumping action of the muscles." Can Dr. Roberts provide an alternative explanation?

Maida Vale Hospital for Nervous Diseases, London, W 9. W. J. PENMAN.

MEDICAL STAFF COMMITTEES IN MUNICIPAL HOSPITALS

SIR,—I was much interested in the views of Mr. Somerville Hastings as published in your issue of Jan. 20. Of special importance to those working full-time in municipal hospitals are his remarks on the extent to which the medical staff should be able to influence the administration of a hospital.

It is evident that Mr. Hastings has in mind a much more democratic method of administration than is the custom in the county council of which he is chairman, and in which medical staff committees are certainly not the rule. Such committees are indeed the exception all over the country; yet, until they are formed, the present dictatorial regime of the medical superintendent (often of advanced years) will continue in local-authority hospitals.

The medical staff committee (consisting, apart from the medical superintendent, of the heads of the medical, surgical, and obstetric departments, as well as of any special units the hospital may possess) should in my opinion be an integral part of the administrative structure of all hospitals. These men are in charge of all clinical work, and their ideas and suggestions for a more efficient service will often be considerably more realistic than those of some medical superintendents, who are above all administrators. There should also be an obligation on the medical superintendent to convey the views of this committee to his local authority, possibly with his own comments. I feel sure that medical officers would do their work with greater concentration and enthusiasm if they knew they had a share in the efficient running of the hospital, as well as a chance of making their views known at the local county hall.

ASSISTANT MEDICAL OFFICER.

AN IMPROVED "BP"

SIR,—Since the publication of the *British Pharmacopœia* in 1932, no less than six addenda have been issued, and we now receive a seventh. Thus the doctor has seven books to consult for information about official drugs, and even then his information must be amplified from other sources. It is true that some of the alterations in the earlier addenda, which were due to shortage of ingredients of some compound medicines, have been cancelled in later ones, after experience which has not always been happy, but this has chiefly been in respect of medicaments for external use, and such as are perhaps of minor importance.

An [illegible] he *BP*. shown particularly [illegible] to give official sanction to, and adequate standards for, at least some of the many potent drugs which are constantly being added to the list of agents recommended for the use of physicians. Of these probably the most potent, and if wrongly used the most toxic, are the sulphonamides, a term which has unfortunately passed into current speech, generally in a mutilated form. But the chemical structure of these bodies can only be understood by competent organic chemists, and their pharmacology is only gradually being worked out. One of them was made official in the Fourth Addendum and nine more are now added in the Seventh. Full chemical information is given concerning these and also tests for identity and purity, but we are told nothing about their pharmacology or therapeutics, except in a statement of the range of doses which are normally safe, and those, somewhat strangely, are uniform throughout, although the substances differ widely in solubility, potency, and toxicity.

We are confronted with the convention—it can be little more—that no notes on pharmacology or therapeutics shall be included in the *British Pharmacopœia*. This was doubtless satisfactory when medicinal agents were either of well-known vegetable origin or simple inorganic salts from the earth, but now that the organic chemists produce a continuous spate of synthetic drugs this policy might well be reconsidered. I understand that in the forthcoming revision of the *United States Pharmacopœia* it has been suggested that all active medicinal agents included should be classified in accordance with their therapeutic actions. There seems to be nothing in the relevant Acts of Parliament to prevent similar or kindred action being taken in this country. The Medical Acts of 1858 and 1862 provide that the General Medical Council shall cause to be published a book containing a list of medicines and compounds and the manner of preparing them, together with the true weights and measures by which they are to be prepared and mixed, and containing *such other matter and things relating thereto as the General Council shall think fit*, to be called *The British Pharmacopœia*. The enabling words, which I have italicised, seem to justify the GMC in breaking the convention. Medical men should not be driven to rely on extra-official works or the ex-parte statements of manufacturers as their sole sources of information concerning the action of drugs.

Exeter. H. WIPPELL GADD.

*** The Seventh Addendum became official on Feb. 1, 1945.—ED. L.

ALKALI FOR CRUSH INJURIES.—In their letter of Feb. 17 Professor Maegraith and Dr. Havard mention a misprint in the second edition of the Medical Research Council's War Memorandum No. 1 *The Treatment of "Wound Shock,"* by which the equivalent of 7 grammes (of sodium bicarbonate) was stated as 2 ounces instead of about 2 drachms. We understand that the mistake, which arose from the printer's misinterpretation of the conventional signs used in the manuscript, was noticed immediately after publication, and that an erratum slip was inserted in all accessible copies.

Parliament

FROM THE PRESS GALLERY

New Housing Policy

IN the House of Commons on Feb. 23 Mr. DUNCAN SANDYS, Minister of Works, stated that the Government had decided in the interests of economy and of town planning to change over as soon as was practicable to the construction of permanent houses which could be built on normal sites and which would not need to be pulled down in a few years' time. He hoped to make a further statement to the House about the method and timing of this [illegible] while he had thought it right to ask [illegible] of temporary houses not to enter into any further long-term commitments beyond what would be required for the next 9 to 12 months' production. Should it become evident that for any reason the start of permanent house building was likely to be delayed, it would be possible, providing that sufficient notice was given, to place continuation orders for temporary houses for a further period. However, in order that there should be no misunderstanding, he wished to make it quite clear that until such time as the permanent house building programme could be got well under way the Government intended to press forward with the manufacture of temporary bungalows to the fullest possible extent. The rate of production would b limited only by the supply of labour, materials, and factory capacity. He hoped that local authorities woul continue to press ahead energetically with the preparation of sites in accordance with the programme whic was being issued to them by the Minister of Health an the Secretary of State for Scotland. The types of temporary bungalows to which he had referred did no include the pressed steel house. Since it could not com into production on any appreciable scale during the nex 12 months he had felt it necessary to reconsider th position in regard to that type. Among other alternatives he was examining with the manufacturers th possibility of substituting a pressed steel two-stor house of permanent construction in place of the temporary bungalow. He was glad to be able to announce tha deliveries of temporary houses during the second half o this year would include a substantial number fron America. A mission had been sent to Washington t ss design and other technical questions and the ed States government had generously declared their iness to send us some 30,000 of these temporary es. They would be similar in size to the standard sh bungalow.

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New Water Bill

moving the second reading of the Water Bill ncet, Feb. 10, p. 190) on Feb. 21 Mr. WILLINK, ster of Health, said that Parliament had already ed legislation for the extension of public water-plies and sewerage in rural localities, and he hoped e course of this session to introduce a measure for the er management of rivers. The present Bill was erned with the conservation and better utilisation of country's water resources, and the improvement of administration of water-supplies. There had come existence two main [illegible] ertakers—those which [illegible] those that operated u [illegible] s duality had given rise [illegible] he general state of the l [illegible] The new Bill enabled all special Act undertakers to do certain things with the ister's consent which public-health Act undertakers ld do already, with Ministerial consent, without the d for special legislation. By this assimilation the gave default powers to the Minister in respect of special Act authorities which he already possessed inst the public-health undertakers. The Bill also tained powers and obligations for safeguarding our er resources, securing their proper use, and extending benefit of piped supplies. There was power to ire, by compulsion if need be, a combination of under-ings. There was also a tightening up of provisions inst waste, misuse, or pollution of water. Summing Mr. Willink said that he believed that the changes ich the Bill made were the minimum necessary for ed, efficiency, and economy combined with adequate eguards. The demand for water was increasing, and this very important service we needed more integra-n, more flexibility, and above all more informed nning. We should not be blind to the fact that a rd of the houses in our countryside were still without a ed water-supply.

Mr. ALEXANDER [illegible]
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healt [illegible] agriculture. There should be a National ter Commission with the power and duty to act con-uously. Mr. T. LEVY thought that the country did t want plans and blue-prints; but a proper water pply. The only way to tackle the problem was to ide the country into water regions, each with its thority armed with adequate powers to develop and ordinate the water services with appropriate State pervision, backing, and credit.

Mr. WOOTTON-DAVIES urged that if chlorine was to be t into water some limit should be put on the amount, d trained chemical control should be provided to sure that the amount was not exceeded. As a chemist held that there was danger in using chlorine in water ich passed through lead pipes and brass taps. More-er, this Bill allowed wells to be sunk to a lesser depth an 50 ft. In small doses arsenic was a good tonic, but e lead it was cumulative poison. He feared that senic used to wash sheep got into somebody's water-pply, and he asked the Government to take special wers to control the way in which sheep were dipped. Hard water was a waster of soap and textiles; there was no reason why this country should not have soft water.

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QUESTION TIME

Hospital Food

Sir E. GRAHAM LITTLE asked the Minister of Health whether he was aware that in certain EMS hospitals under the management of county councils a system prevailed whereby the steward benefits personally by keeping the expenses below a certain figure, and that this led to reducing the standard of food supplied to resident medical staff and patients.—Mr. H. WILLINK replied: I have no evidence of the existence of this.

Relief for Poland

Captain ALAN GRAHAM asked the Secretary of State for Foreign Affairs what arrangements had been made either by the Soviet Government, the International Red C [illegible]

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a position to make a stateme [illegible]
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mittee during the later stages [illegible]

is load [illegible] shipments will be made on an increased scale as additional port facilities and means of overland transport in Eastern Europe become available.

CHILDREN AWAITING SAN [illegible]
LINK [illegible]
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instit [illegible] of non-pulmonary tuberculosis.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED FEB. 17

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1107; whooping-cough, 1530; diphtheria, 427; paratyphoid, 1; typhoid, 11; measles (excluding rubella), 19,167; pneumonia (primary or influenzal), 1206; puerperal pyrexia, 110; cerebrospinal fever, 73; poliomyelitis, 1; polio-encephalitis, 0; encephalitis lethargica, 0; dysentery, 357; ophthalmia neonatorum, 53. No case of cholera, plague, or typhus fever was notified during the week.

The number of [illegible]
of the [illegible]
[illegible] scarlet fever, 78; 25.

[illegible] great towns there were no deaths from enteric fever, 2 (0) from scarlet fever, 10 (1) from measles, 14 (2) from whooping-cough, 9 (0) from diphtheria, 62 (8) from diarrhœa and enteritis under two years, and 55 (11) from influenza. The figures in parentheses are those for London itself.

There was 1 death from an enteric fever in Greater London. Birmingham reported 11 fatal cases of diarrhœa

The number of stillbirths notified during the week was 210 (corresponding to a rate of 30 per thousand total births), including 13 in London.

MOH FEVER HOSPITAL GROUP.—A meeting will be held at the London School of Hygiene, Keppel Street, WC1, on Friday, March 9, at 3 PM, when Prof. Arnold Sorsby will open a discussion on the epidemiology and treatment of some eye infections.

as patients sometimes do on their own account or on a nurse's instructions, does not have the same effect.)

This fact, so familiar to all house-physicians, is fully explained by "the theory of the pumping action of the muscles." Can Dr. Roberts provide an alternative explanation?

Maida Vale Hospital for Nervous Diseases, London, W9. W. J. PENMAN.

MEDICAL STAFF COMMITTEES IN MUNICIPAL HOSPITALS

SIR,—I was much interested in the views of Mr. Somerville Hastings as published in your issue of Jan. 20. Of special importance to those working full-time in municipal hospitals are his remarks on the extent to which the medical staff should be able to influence the administration of a hospital.

It is evident that Mr. Hastings has in mind a much more democratic method of administration than is the custom in the county council of which he is chairman, and in which medical staff committees are certainly not the rule. Such committees are indeed the exception all over the country: yet, until they are formed, the present dictatorial regime of the medical superintendent (often of advanced years) will continue in local-authority hospitals.

The medical staff committee (consisting, apart from the medical superintendent, of the heads of the medical, surgical, and obstetric departments, as well as of any special units the hospital may possess) should in my opinion be an integral part of the administrative structure of all hospitals. These men are in charge of all clinical work, and their ideas and suggestions for a more efficient service will often be considerably more realistic than those of some medical superintendents, who are above all administrators. There should also be an obligation on the medical superintendent to convey the views of this committee to his local authority, possibly with his own comments. I feel sure that medical officers would do their work with greater concentration and enthusiasm if they knew they had a share in the efficient running of the hospital, as well as a chance of making their views known at the local county hall.

ASSISTANT MEDICAL OFFICER.

AN IMPROVED "BP"

SIR,—Since the publication of the *British Pharmacopœia* in 1932, no less than six addenda have been issued, and we now receive a seventh. Thus the doctor has seven books to consult for information about official drugs, and even then his information must be amplified from other sources. It is true that some of the alterations in the earlier addenda, which were due to shortage of ingredients of some compound medicines, have been cancelled in later ones, after experience which has not always been happy, but this has chiefly been in respect of medicaments for external use, and such as are perhaps of minor importance.

An outstanding function of the *BP*, shown particularly in the Seventh Addendum, is to give official sanction to, and adequate standards for, at least some of the many potent drugs which are constantly being added to the list of agents recommended for the use of physicians. Of these probably the most potent, and if wrongly used the most toxic, are the sulphonamides, a term which has unfortunately passed into current speech, generally in a mutilated form. But the chemical structure of these bodies can only be understood by competent organic chemists, and their pharmacology is only gradually being worked out. One of them was made official in the Fourth Addendum and nine more are now added in the Seventh. Full chemical information is given concerning these and also tests for identity and purity, but we are told nothing about their pharmacology or therapeutics, except in a statement of the range of doses which are normally safe, and those, somewhat strangely, are uniform throughout, although the substances differ widely in solubility, potency, and toxicity.

We are confronted with the convention—it can be little more—that no notes on pharmacology or therapeutics shall be included in the *British Pharmacopœia*. This was doubtless satisfactory when medicinal agents were either of well-known vegetable origin or simple inorganic salts from the earth, but now that the organic chemists produce a continuous spate of synthetic drugs this policy might well be reconsidered. I understand that in the forthcoming revision of the *United States Pharmacopœia* it has been suggested that all active medicinal agents included should be classified in accordance with their therapeutic actions. There seems to be nothing in the relevant Acts of Parliament to prevent similar or kindred action being taken in this country. The Medical Acts of 1858 and 1862 provide that the General Medical Council shall cause to be published a book containing a list of medicines and compounds and the manner of preparing them, together with the true weights and measures by which they are to be prepared and mixed, and containing *such other matter and things relating thereto as the General Council shall think fit*, to be called *The British Pharmacopœia*. The enabling words, which I have italicised, seem to justify the GMC in breaking the convention. Medical men should not be driven to rely on extra-official works or the ex-parte statements of manufacturers as their sole sources of information concerning the action of drugs.

Exeter. H. WIPPELL GADD.

*** The Seventh Addendum became official on Feb. 1, 1945.—ED. L.

ALKALI FOR CRUSH INJURIES.—In their letter of Feb. 17 Professor Maegraith and Dr. Havard mention a misprint in the second edition of the Medical Research Council's War Memorandum No. 1 *The Treatment of "Wound Shock,"* by which the equivalent of 7 grammes (of sodium bicarbonate) was stated as 2 ounces instead of about 2 drachms. We understand that the mistake, which arose from the printer's misinterpretation of the conventional signs used in the manuscript, was noticed immediately after publication, and that an erratum slip was inserted in all accessible copies.

Parliament

FROM THE PRESS GALLERY

New Housing Policy

IN the House of Commons on Feb. 23 Mr. DUNCAN SANDYS, Minister of Works, stated that the Government had decided in the interests of economy and of town planning to change over as soon as was practicable to the construction of permanent houses which could be built on normal sites and which would not need to be pulled down in a few years' time. He hoped to make a further statement to the House about the method and timing of this change-over. Meanwhile he had thought it right to ask the manufacturers of temporary houses not to enter into any further long-term commitments beyond what would be required for the next 9 to 12 months' production. Should it become evident that for any reason the start of permanent house building was likely to be delayed, it would be possible, providing that sufficient notice was given, to place continuation orders for temporary houses for a further period. However, in order that there should be no misunderstanding, he wished to make it quite clear that until such time as the permanent house building programme could be got well under way the Government intended to press forward with the manufacture of temporary bungalows to the fullest possible extent. The rate of production would be limited only by the supply of labour, materials, and factory capacity. He hoped that local authorities would continue to press ahead energetically with the preparation of sites in accordance with the programme which was being issued to them by the Minister of Health and the Secretary of State for Scotland. The types of temporary bungalows to which he had referred did not include the pressed steel house. Since it could not come into production on any appreciable scale during the next 12 months he had felt it necessary to reconsider the position in regard to that type. Among other alternatives he was examining with the manufacturers the possibility of substituting a pressed steel two-storey house of permanent construction in place of the temporary bungalow. He was glad to be able to announce that deliveries of temporary houses during the second half of this year would include a substantial number from America. A mission had been sent to Washington to discuss design and other technical questions and the United States government had generously declared their readiness to send us some 30,000 of these temporary houses. They would be similar in size to the standard British bungalow.

Mr. A. GREENWOOD said this was a definite change of policy. There could be no separation of the temporary from the permanent problem. The House was apprehensive about the housing situation and would require an early debate, and Mr. E. SHINWELL asked for an assur- [illegible] debate would be arranged as soon as possible. Later Captain E. C. COBB and a number of other members gave notice of a motion to the effect that the House "views with concern the failure of the Government to announce a definite programme of house building and calls for the use of all possible measures to speed up the production of both temporary and permanent houses."

New Water Bill

In moving the second reading of the Water Bill (*Lancet*, Feb. 10, p. 190) on Feb. 21 Mr. WILLINK, Minister of Health, said that Parliament had already passed legislation for the extension of public water-supplies and sewerage in rural localities, and he hoped in the course of [illegible] proper manage[illegible] concerned with [illegible] the country's water resources, and the improvement of the administration of water-supplies. There had come into existence two main, but dissimilar types of water undertakers—those which operated under special Acts, and those that operated under the public-health Acts. This duality had given rise to an unsatisfactory situation in the general state of the law. The new Bill enabled all the special Act undertakers to do certain things with the Minister's consent which public-health Act undertakers could do already, with Ministerial consent, without the need for special legislation. By this assimilation the Bill gave default powers to the Minister in respect of the special Act authorities which he already possessed against the public-health undertakers. The Bill also contained powers and obligations for safeguarding our water resources, securing their proper use, and extending the benefit of piped supplies. There was power to secure, by compulsion if need be, a combination of undertakings. There was also a tightening up of provisions against waste, misuse, or pollution of water. Summing up, Mr. Willink said that he believed that the changes which the Bill made were the minimum necessary for speed, efficiency, and economy combined with adequate safeguards. The demand for water was increasing, and in this very important service we needed more integration, more flexibility, and above all more informed planning. We should not be blind to the fact that a third of the houses in our countryside were still without a piped water-supply.

Mr. ALEXANDER WALKDEN asked for the reorganisation of our catchment boards, and regretted that responsibility for water was to be divided between the ministers of heal[illegible] should be a National Water [illegible] r and duty to act continuous[illegible] that the country did not want plans and blue-prints; but a proper water supply. The only way to tackle the problem was to divide the country into water regions, each with its authority armed with adequate powers to develop and coördinate the water services with appropriate State supervision, backing, and credit.

Mr. WOOTTON-DAVIES urged that if chlorine was to be put into water some limit should be put on the amount, and trained chemical control should be provided to ensure that the amount was not exceeded. As a chemist he held that there was danger in using chlorine in water which passed through lead pipes and brass taps. Moreover, this Bill allowed wells to be sunk to a lesser depth than 50 ft. In small doses arsenic was a good tonic, but like lead it was cumulative poison. He feared that arsenic used to wash sheep got into somebody's water-supply, and he asked the Government to take special powers to control the way in which sheep were dipped. Hard water was a waster of soap and textiles; there was no reason why this country should not have soft water.

Mr. CLEMENT DAVIES had seen dozens of medical officers' reports condemning water-supplies yet nothing had been done. This to a large extent was a re-enactment Bill with a little more power taken here and there. The Government should go in for a really national water policy and cover the whole field. But Miss F. HORSBRUGH replying to the debate, thought that the Minister was taking sweeping powers. Members said that they wanted the Minister to take more powers, but they did not make it clear what those powers should be.

QUESTION TIME

Hospital Food

Sir E. GRAHAM-LITTLE asked the Minister of Health whether he was aware that in certain EMS hospitals under the management of county councils a system prevailed whereby the steward benefits personally by keeping the expenses below a certain figure, and that this led to reducing the standard of food supplied to resident medical staff and patients.—Mr. H. WILLINK replied: I have no evidence of the existence of this.

Relief for Poland

Captain ALAN GRAHAM asked the Secretary of State for Foreign Affairs what arrangements had been made either by the Soviet Government, the International Red Cross, or UNRRA for the provision of at least as much food, clothing, and medical supplies as was possible under the German occupation to the remaining 700,000 of the former population of Warsaw. —Mr. A. EDEN replied: I understand that relief is being supplied to Poland by the Soviet government, but I am not in a position to make a statement on the quantities involved. Relief taken to Poland by the International Red Cross Committee during the later stages of the German occupation was increasingly hampered by the interruption of communications, and has now been brought to a stop by the development of an active battlefront between Switzerland and Poland. UNRRA has for some time been preparing food, clothing, and medical supplies for despatch to Poland, and the first ship of supplies *is loading now. It is expected that shipments will be made* on an increased scale as additional port facilities and means of overland transport in Eastern Europe become available.

CHILDREN AWAITING SANATORIUM TREATMENT.—Mr. WILLINK said that returns from local authorities on Dec. 31 showed that 436 children in England and 112 in Wales were awaiting institutional treatment for pulmonary or non-pulmonary tuberculosis.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED FEB. 17

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1497; whooping-cough, 1530; diphtheria, 427; paratyphoid, 1; typhoid, 11; measles (excluding rubella), 19,167; pneumonia (primary or influenzal), 1206; puerperal pyrexia, 110; cerebrospinal fever, 73; poliomyelitis, 1; polio-encephalitis, 0; encephalitis lethargica, 0; dysentery, 357; ophthalmia neonatorum, 53. No case of cholera, plague, or typhus fever was notified during the week.

Deaths.—In 126 great towns there were no deaths from enteric fever, 2 (0) from scarlet fever, 16 (1) from measles, 11 (2) from whooping-cough, 9 (0) from diphtheria, 62 (8) from diarrhœa and enteritis under two years, and 55 (11) from influenza. The figures in parentheses are those for London itself.

There was 1 death from an enteric fever in Greater London. Birmingham reported 14 fatal cases of diarrhœa.

The number of stillbirths notified during the week was 210 (corresponding to a rate of 30 per thousand total births), including 13 in London.

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Obituary

FREDERICK WILLIAM EURICH

MD EDIN.

Dr. Eurich, who died on Feb. 16 at his home near Southampton, was professor of forensic medicine in the University of Leeds from 1908 to 1932, and was a leading authority on anthrax.

Press Portrait Bureau

He was born in 1867 at Chemnitz in Germany, but was educated at Bradford Grammar School and the University of Edinburgh. After qualifying in 1891 he went back to Germany and studied at Heidelberg, Berlin, and Frankfort-on-Main. He then spent several years at the Lancashire County Asylum at Whittingham, latterly as pathologist, and contributed to *Brain* and the *Journal of Anatomy and Physiology* a series of studies of neuroglia. He joined the staff of the Bradford Royal Infirmary, first as assistant physician, in 1898, and soon afterwards he was appointed assistant surgeon to the Bradford Royal Eye and Ear Hospital. His interest, however, lay largely in pathology, and he became bacteriologist to the city of Bradford in 1901 and to the Anthrax Investigation Board for Bradford and District in 1905. Having been made demonstrator in toxicology at Leeds in 1902, he was elected to the chair of forensic medicine six years later. He was an admirable teacher, and the course which he gave of 40 lectures and demonstrations was a notable one. In the preparation of his subject matter he always took great pains, and no class in the school of medicine was better attended. On his retirement he was appointed professor emeritus.

Eurich's chief claim to fame, however, is his work on anthrax. He had a greater experience of this disease than any other man in this country. He conducted the post-mortem examinations of all the anthrax cases in the Bradford area and these were at one time very numerous. The institution of the Government Disinfecting Station at Liverpool was largely due to his initiative and energy, and he was personally responsible for much of the control bacteriological investigation carried out in connexion with this scheme. The value of his services to the woollen trade of Bradford through the control of anthrax received full recognition, as shown by the award of the Textile Institute's gold medal. The Home Office appointed him specialist medical referee on anthrax and on poisoning by aniline and lead.

In addition he was in practice as a consulting physician in Bradford for a long period of years, becoming in due course physician and consulting physician to the Royal Infirmary. He was also for many years hon. pathologist there. Conscientiousness in everything he undertook was his outstanding characteristic. He was a sound physician with a particular flair for nervous diseases, and his services were greatly appreciated by practitioners. The amount of work that he did without hope or expectation of financial reward was exceptional; indeed for many years he conducted a free clinic on Saturday afternoons for patients who could not afford a fee and who were referred to him by Bradford doctors. When finally he retired from practice and went to live in Hampshire a dinner was organised in his honour and was attended by many professional colleagues, civic personages, and leaders of industry in Bradford, Leeds, and elsewhere. Remarkable tributes were paid on that occasion to the value of his services to the community.

Professor Eurich married M. G. Carter-Squire, and they had two sons and three daughters. His son Richard has already made a name for himself. He is an Admiralty artist, and his large canvas *Antwerp* was purchased last year by the Chantrey Bequest.

HAROLD MASON LEETE

MD, B HY DURH., D P H

Dr. Leete, superintendent of the Hull City Hospital, died after a short illness on Feb. 15 at the age of 50. Educated at St. Bees School and the University of Durham, he graduated MB in 1917. He held house-appointments at the Royal Victoria Hospital, Newcastle-on-Tyne, but he had already chosen public health as his specialty and after obtaining his DPH and B Hy at Durham in 1918 he was appointed senior medical assistant and bacteriologist at the Edinburgh City Hospital for Infectious Diseases. Here he undertook the investigation into the reliability of the Schick test and its suitability for general and hospital practice which was later published in our columns (1920, i, 192) and which was the first English paper on the subject. In 1920 he joined the staff of the public health department of Birkenhead, and much of his time there was spent studying the bacteriology of tuberculosis. His MD thesis in 1921 dealt with respiratory disease, and his interest in the diagnosis and treatment of infections was constant. His carefully prepared and concisely expressed reports were widely read: in 1924 with a colleague he described the Birkenhead outbreak of typhus, and since he moved to Hull in 1930 his work on the incidence of diphtheria gravis in that city has been an important contribution to the epidemiology of the disease. An expert clinician, a skilled bacteriologist, and an able administrator, Leete proved himself an admirable superintendent. His patients—and especially the children—loved him, and his clinical demonstrations were thronged. His only son was killed while serving with the RAF in North Africa, and he leaves his widow with one daughter.

JOHN ROBERT WALKER

MRCS, LSA

Dr. J. R. Walker, who died at Hove on Feb. 3 some six weeks after his 99th birthday, qualified MRCS from St. Mary's Hospital in 1868 and had served as a surgeon with the International Ambulance during the Franco-German war. He was awarded the German wa medal and ribbon for his services in the campaign an he also held the medal and diploma of the Fr Society of Aid for Sick and Wounded. He settled i practice in St. John's Wood, but with the British Re Cross Society he continued his valuable work for th wounded and as the eldest surgeon of the societ lately received a letter of congratulation from the Duk of Gloucester. After Dr. Walker's retirement he live for many years at Tunbridge Wells and he was burie there.

JOHN CRIMMIN

VC, CB, C I E, L R C P I, LATE IMS

Colonel John Crimmin, who died at his home at Well on Feb. 20 at the age of 85, received the VC from Quee Victoria for his bravery while serving as a surgeon wit the Bombay Medical Service in 1889. In the officia citation an officer of the Mounted Infantry, to whic Crimmin was attached, relates how "in the action nea Lwekaw, Eastern Karenni, on Jan. 1 last, four me charged with him into the midst of a large body of th enemy who were moving off from the Karen left flank and two men fell to the ground wounded. He sa Surgeon Crimmin attending one of the men about 10 yards to the rear. Karens were round the party in every direction, and he saw several fire at Surgeon Crimmi and the wounded man. A sepoy then galloped up t Surgeon Crimmin, and the latter joined the fighting lin which then came up. Shortly afterwards they wer engaged in driving the enemy from small clumps of tree and bamboo, in which the Karens took shelter. Near on of these clumps he saw Surgeon Crimmin attending wounded man. Several Karens rushed out at him Surgeon Crimmin thrust his sword through one of ther and attacked a second: a third Karen then dropped fro the fire of a sepoy, upon which the remaining Karen fled."

Crimmin qualified in 1882 and entered the IMS th same year. Besides joining the Burmese expedition 1886–89 he saw active service during the last war on th

North West Frontier while acting as assistant director of medical services in India. From 1916 till he retired

King. Colonel

s, one an officer

-Colonel George

GUSTAV SINGER

MD

Professor Singer, who died in London last December in his 76th year, held for three decades, from 1905 to 1935, the post of chief physician of the medical department of the famous Rudolf Hospital in Vienna where he taught and inspired a great number of pupils. He will be chiefly remembered perhaps for his work on acute rheumatism. He showed vision in realising the significance of this disease, and in suspecting—almost half a century ago—its association with streptococcal infection entering the body through diseased tonsils. This led him to recommend tonsillectomy for prevention and cure. H

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e conservative treatment of pulmonary abscesses and for combating chronic purulent diseases of the lungs and bronchi was also first used by him; it is Singer's so-called thirst cure. Though his "non-specific irritants therapy" for diabetes did not receive the recognition desired by its author, his idea that for every form of treatment, and in particular for the treatment of diabetes, a special system of welfare is required has promoted the establishment of welfare and consulting centres in Austria and abroad.

Births, Marriages, and Deaths

BIRTHS

CONWAY.—On Feb. 16, at Poole, the wife of Flight-Lieutenant D. J. Conway, MB, RAFVR—a son.

Dr. F. G. Elvins,

rey, the wife of

wife of Captain

f Major W. D'A.

Blaycock—a son.

MILLAR.—On Feb. 23, at Tynemouth, Northumberland, to Elbea (née Beatton), wife of Surgeon Lieut.-Commander A. McL. Millar—a son.

vat, FRCS, of Mulajo,

of Major G. Riddell

. R. Douglas Sweet,

ife of Captain S. W.

wife of Lieut. G.

ife of Dr. G. E. H.

Tisdall—a son.

WATLING.—On Feb. 20, the wife of Dr. J. D. S. Watling, New Barnet—a daughter.

MARRIAGES

COXON—BOWEN.—On Dec. 1, in India, Victor Coxon, MD, major RAMC, to Mary Bowen, MB, captain RAMC.

DAVIS—[illegible]

DEATHS

AVELING.—On Feb. 24, at Chatham, Charles James Aveling, MRCS, surgeon captain RN.

CLARKE.—On Feb. 21, at Leicester, Astley Vavasour Clarke, MD CAMB., DL, JP.

CRIMMIN.—On Feb. 20, at Wells, Somerset, John Crimmin, VC, CB, CIE

NICHOLSON.—On Feb. 19, at Newton Stewart, Wigtownshire, Benjamin Hugh Nicholson, MB EDIN., formerly of Colchester, aged 85.

O'DRISCOLL.—On Jan. 29, Jeremiah O'Driscoll, MD NUI.

On Active Service

CASUALTIES

KILLED IN ACTION

Captain M. D. M. BERGIN, MB DUBL., RAMC

Captain ARCHIBALD MENZIES OGILVIE, MB CAMB., RAMC

ACCIDENTALLY KILLED

Lieut.-Colonel MAURICE BAYLIS KING, MC, MB DUBL., RAMC

WOUNDED

Lieutenant R. A. GREEN, RAMC

AWARDS

MC

Captain J. W. R. BATTRAM, RAMC

Between Nov. 16, 1943, and May 15, 1944, Captain Battram has

of the utmost value in maintaining a very high morale.

Lieutenant K. C. STEPHENSON, RAMC

enemy observation. The whole area soon came under intense shell and morta

cover for hours

Sept. 7. In sp

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dead. He did [illegible] work until the regimental

MENTIONED IN DESPATCHES

Brigadier J. M. TWHIGG, DSO, MD, NZMF

Appointments

ATKINSON, E. A., MB LOND.: temp. pathologist and asst. MO at Oldchurch County Hospital, Romford.

FLEMING, R. A., MB DUBL., FRCSE: orthopædic RSO at Hexham Emergency Hospital.

WILLIAMSON, GEOFFREY, MD MANC., DPM: medical superintendent at the County Mental Hospital, Rainhill, Lancs.

Colonial Service.—The following appointments are announced:

SUTHERLAND, E. S., LRCPE: AMO Jamaica;

HOWAT, C. H., MB EDIN., FRCSE, DTM & H: senior MO (Surgeon Specialist), Cyprus;

LOUW, G., MB EDIN., DTM & H: senior MO, Uganda;

MACLENNAN, N. M., MD ABERD., DPH, DTM & H: DMS, Kenya;

WILKIN, B. O., MB EDIN., DPH: senior MO, Tanganyika.

PENICILLIN BY MOUTH.—Raymond L. Libby, of the American Cyanamid Company, claims successful results in animals and patients with penicillin given by mouth in pills. The pills are said to be coated with gelatin and to contain penicillin suspended in vegetable or mineral oil. At room temperature they are said to keep for months without loss of potency. Hitherto the difficulty, as was mentioned in our leading article of Feb. 17, has been to devise a coating which can be trusted to dissolve at the right time and place in the alimentary tract. No detailed information about the pills has yet reached this country.

Notes and News

THE UNPROTECTED CHILD

A NEW pamphlet (*Whose Children?* Simpkin Marshall. Pp. 32. 1*s.*) is the outcome of a correspondence begun by Lady Allen of Hurtwood in the *Times* last July, calling for a public inquiry into the needs of children who are deprived of normal home life and fall to the care of a public authority or benevolent institution. She quotes from this correspondence and from private letters from men and women who were brought up in, or connected with, such homes. Some of the writers state their facts sentimentally and with evident prejudice; but it is significant that many of them tell how bitter were their feelings as "deprived children." Lady Allen quotes Susan Isaacs's remark that "institutional life as such is terribly impoverishing to the spirit." That important point cannot be too often repeated. The child requires an individual and personal background of love and nurture in order to undergo normal development, and this will never be achieved until we are prepared to ensure reasonable standards of knowledge and training in those undertaking the care of children deprived of their own homes. This is a propitious moment to concentrate public attention on the problem, for evacuation has taught the country many lessons, and some constructive solutions, and public feeling is alert as never before to the fate of these dependent children.

The Government announced on Feb. 22 the appointment of a committee to inquire into the provision made for children deprived of a normal home life. The chairman is Miss Myra Curtis (principal of Newnham College, Cambridge), and the 16 members, of whom 8 are women, include Mr. Somerville Hastings, FRCS, and Prof. J. C. Spence, FRCP.

A SHORTER NURSING CONTRACT

VAD nurses and nursing auxiliaries have always felt some resentment because their nursing experience, which in war-time may be considerable, is not taken into account when they wish to enter for a full nursing training course. They have always been required to go through the full four years' course. Lately the Ministry of Health requested authorities to remit part of the period of training for such women. The General Nursing Council have stated their opinion that it would be unwise to shorten the period of training in such cases, but they have suggested that authorities of general training schools which offer girls a four-year contract might remit some time to suitable auxiliaries and VADs in their fourth year, after they have become State-registered. The LCC has decided to put this proposal into effect, and has arranged that special groups shall be accepted for a three-year course of training in general nursing, at first-, second- and third-year salary rates, provided they have had two years' recent full-time nursing service in approved training schools or other hospitals of similar standing. The groups affected are:

Untrained members of the Civil Nursing Reserve (assistant nurses and nursing auxiliaries).

VAD nurses (members of the British Red Cross Society and the St. John Ambulance Brigade).

Nurses in or outside the LCC service who hold the certificate of the Tuberculosis Association.

A SEMINOLOGICAL LABORATORY

GROWING numbers of women attending "family planning" centres seek advice on the treatment of sterility. The subfertility committee of the Family Planning Association has been working to establish a seminological laboratory and clinic in London, and the annual report of the association[1] announces that such a clinic has now been opened at 33, Wimpole Street, W1, in charge of Dr. H. J. Davidson. Studies in seminology have been carried on, in connexion with the Exeter clinic, by Mrs. Clare Harvey, and work at the London laboratory is expected to develop along similar lines. Workers on sterility have always been hampered by differences in methods of examining semen, which make it impossible to compare results from different centres. Mrs. Harvey's aim has been to evolve a standard technique, which should overcome this difficulty. If, as the Association intends, it becomes possible to open laboratories in other parts of the country, a large body of comparable data should soon be collected for study. The London laboratory will undertake investigations for clinic patients at specially low rates. Its services are also available for private practitioners who wish to have cases investigated.

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[1] Fourteenth Annual Report. 1944. Obtainable from the Secretary, 69, Eccleston Square, London, SW1.

WOMEN DOCTORS IN THE RED ARMY

AT the end of last year Major G. K. Thornton, RAMC, toured Red Army medical units on one of the fronts. Describing his visit in the Medical Women's Federation *Quarterly Review* for January, he says that though he knew many women doctors were serving in the army he was surprised at the number he met in the battle area. A few kilometres from the front, in the *medsanbats*, which are something like our field ambulance but undertake more surgery, there are usually some women doctors. Nursing sisters and women orderlies also serve in these units, and at the battalion medical posts women stretcher-bearers, though rare, are not unknown. In hospitals a little further back there are still more women doctors, and in a small field hospital which Thornton inspected all the MOs were women. The *nachalnik*, or administrative commander, who was the only man on the medical staff, on being asked the proportion of medical women in the forward area replied: "There are no statistics, as the matter is of no interest to us." Some of the wounded are women who have volunteered as snipers. On the whole Major Thornton considers that in Russia women are accepted as standing equal with men on any job they can do—an ideal of sex equality, but he wonders whether all Western women would appreciate it.

University of Manchester

Dr. R. E. Lane has been appointed to the chair of industrial health, for whose establishment the Nuffield Foundation lately made a grant of £70,000. He is likely to take up his duties next September.

Dr. Lane served with the Royal Flying Corps from 1915 to 1919, and qualified in 1923 from Guy's Hospital, where he held house-appointments. During two years' general practice in Nottingham he took his MRCP, and at the end of 1927 he went to Manchester to take up a post with the Chloride Electrical Storage Company, primarily to investigate lead-poisoning. Later the scope of his work was broadened to include associated companies. He was appointed hon. assistant physician to Salford Royal Hospital in 1934, and full physician in 1941. He was one of the founders of the Association of Industrial Medical Officers in 1935, and its chairman in 1940 and 1941. From 1936 to 1941 Dr. Lane served on the Industrial Health Research Board of the Medical Research Council, and he is also an hon. consulting physician to the Ministry of Supply. In the University of Manchester he has been lecturer in factory hygiene since 1938 and lecturer in medicine since 1941. His publications include papers on lead-poisoning and on health legislation in industry. He was elected FRCP in 1939.

University of Wales

Mr. Alastair Worden has been appointed to the research professorship in animal health recently endowed by Lord Milford at the University College of Wales, Aberystwyth, to investigate the health and productivity of livestock with special reference to human nutrition. Mr. Worden, who is a graduate of the Universities of Cambridge and London and a member of the Royal College of Veterinary Surgeons, is at present a member of the staff of the Institute of Animal Pathology, Cambridge.

Medical Society of LCC Service

There will be a meeting on Thursday, March 8, at 2.30 PM, at St. Stephen's Hospital, Fulham Road, SW10, when members of the staffs of St. Stephen's, Fulham, and St. Mary Abbott's Hospital will demonstrate cases.

Royal Society of Medicine

On Tuesday, March 6, there will be a meeting of fellows at 5 PM. On March 7, at 2.30 PM, at the section of history of medicine Mr. Henry Robinson, librarian of the Royal Society, will read a paper on Robert Hooke.

Food Education Society

The society is holding three lectures at the London School of Hygiene, Keppel Street, WC1, during April and May. On April 16, Mr. A. L. Bacharach will speak on the science, logic, and art of food; on April 23, Lord Portsmouth on food and agriculture, and on May 3, Sir Adolphe Abrahams, FRCP, on food and physique. All the lectures will begin at 2.30 PM.

MOH's Jubilee

The Mayor and council of Ilford, together with members of the staff of the public health department, have presented Dr. A. H. G. Burton with a gold fountain-pen and cheque. Dr. Burton has lately completed 25 years as MOH for the borough.

The fact that goods made of raw materials in short
to war conditions are advertised in this
as an indication that they are necessa

MEDICINE AND THE STATE *

LORD HORDER, M D LOND., F R C P
CONSULTING PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL, LONDON

I AM going to talk about the proposed National Health Service. This is a matter which deeply concerns all of us, whether we are on the threshold of our career, or, like myself, we are far advanced in it.

It is of great importance that we face the issue—for it is an issue—clearly and with judgment; and we can only do this if we recognise what is our proper function in relation to society. The hackneyed "to thine own self be true" applies as much to crafts and professions as it does to individuals.

I am not going to plunge into an involved discussion of the famous white-paper. As I shall say later, repeating what I have already said elsewhere, I believe the issue between ourselves and the Government can be reduced to fairly simple terms There are essentials in this particular situation, as there are in most situations; and it is paramount that we see them and do not get stifled in a mass of details. I think the best way of finding these essentials is to consider quite briefly the basic factors in the—(how shall I put it?) the drama that is being enacted, or the battle that is being waged. I suppose the most apposite phrase would be the comedy that is being played, but if I choose that phrase I use the word "comedy" in the Meredithian sense.

The elements concerned are three: there is Medicine, there is Society, and there is the State. About Society—in which Medicine and the State meet—I shall not have much to say. But I want to take a step back and look at the two principal actors, assess their proper rôles, and thus be prepared to trace them through the play, watching to see if they follow their rightful cues or depart from these. Because in proportion as they follow their cues the play will be a good one.

It is only by taking this step back that we can get a proper perspective, and avoid being trivial. And if we are trivial our cause is lost.

Medicine

What then of Medicine? A definition is impossible and even a description is a bold thing to attempt. Medicine is a great corpus of knowledge and technique, a tradition, a steady stream of advance in science and art applied to human welfare, a brotherhood of common interest amongst those inside, and a great fund of good will towards those without. The material upon which Medicine lives and out of which it grows is all created things. It can say, with Bacon, "I have taken the universe for my parish." But its special study and care are the body and mind of man.

But when we have said all that, we have still omitted a very important and characteristic feature of Medicine. We have not included the large body of men and women all over the globe who are the disciples of Medicine and in whom, more than in books and museums and laboratories and even hospitals, *the spirit of Medicine is resident.*

What of these disciples? They are, at first very ordinary men and women, but they gradually become consecrated in as true a sense as does the priest. No, on reflection, I don't think they are quite ordinary. I think it is likely that the medical student's exuberance—often shown in ways that the public, and even the stipendiary, doesn't understand—is only the expression of that spirit of adventure and conquest which, later on, becomes of tremendous value in Medicine. The layman often thinks we doctors are attracted to Medicine by sentimental and altruistic motives. Of course he is wrong. Medicine is to the good doctor a form of sport at first, and it remains so until the end. The student passes from ragging to the football or the cricket field, and th[illegible] [illegible]nd yachting, or, for the more [illegible] or gardening; but all the tir[illegible] pursuit. All the same there [illegible] to which I referred as consecration, going on in most of us. I cannot describe it better than—no, not half so well as—it was described by a great clinician, Peter Mere Latham: "This body," he said, speaking to his students, "must be your study and your continual care. Nothing must make you shrink from it."

> "In its weakness and infirmities you must still value it—and stay by it—to mark its hunger and thirst, its sleeping and waking, its heat and its cold. . . . And is it possible to feel an interest in all this? Ay, indeed it is; a greater interest than painter or sculptor took in the form of its health.
>
> "Whence comes this interest? At first perhaps it seldom comes naturally; a mere sense of duty must engender it; and, still, for awhile, a mere sense of duty must keep it alive. Presently, the quick, curious, restless spirit of science enlivens it; and then the deliberate choice of the mind. When the interest . . . has reached this point, there arises from it . . . a ready discernment of diseases, and a skill in the use of remedies. And the skill may exalt the interest, and the interest may improve the skill, until, in process of time, experience forms the consummate practitioner. But does the interest of attending the sick necessarily stop here? . . . What if humanity shall warm it? Then this interest, this excitement, this intellectual pleasure, is exalted into a principle, and invested with a moral motive, and passes into the heart."

And if you think that is only idealism, then turn to the old realist Montaigne. There is, he said, "a ravishing kind of satisfaction in helping another."

THE DOCTOR

It is not possible to possess this power and to exercise it, as the doctor does, without its leaving its mark upon the character—yes, and upon the face.

Doctors are often sketched or drawn, and artists rather fancy themselves that they can paint the type. In some cases their observations haven't been very good, nor their work very complimentary. All the same, of course you *can* "spot" doctors again and again—in the train, on the bus and at the theatre. I have often been asked how I knew the doctor—quite a stranger to me—when I walked up to him at the arrival platform and bade him good morning. It would take some time to give the whole answer, and I mightn't always be understood; so I generally say that I accosted the most intelligent person I could see. I say "person" because I am getting fairly good at this with the other sex also—though the "whole answer" (not the one I give; for that, of course, is the same) is a little different.

I forget who it was who sat for the doctor in Luke Fildes's famous picture; but of course it isn't the beard, still less the professional attire, that bespeaks the man's job: it is that intense, that concentrated look, in which are depicted the interplay of various emotions—interest in the clinical problem presented, trust that what has been found good in his training and his experience will serve him now, humility in the face of things still unknown and withal a large dose of the tincture of human sympathy.

THREE AXIOMS

Are you thinking "but what has all this to do with Medicine?" My answer is, a great deal; much more than it has entered into the head of the politician to conceive.

I want to lay it down as an axiom that *Medicine is resident in a personnel* and if you take away the personal element from Medicine you emasculate it; that the doctor, with his special bent, his keenness, his long training, and his special experience, is an integral part of Medicine—is the most important part of Medicine. If you control him—by more than the control we all accept as members of a community—*or/and* if you stereotype him and deprive him of his individuality, you do a great disservice to Medicine and therefore to Society.

I want to state two more axioms. My second is that a man does better work for himself and his security (and of course this includes his family) than he does for the State. *Prof. Henry Cohen*, in his excellent survey of [illegible] rvice [illegible] why [illegible] nd he [illegible] as saying in his *Mission to Moscow* that the profit motive and self-interest are the mainspring of service in the USSR, where, from top to bottom, production is stimulated by pensions and extra wages for service above what they conventionally call the "norm." And what is the "norm" in a doctor's work, anyway?

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* An address given before the Middlesex Hospital Medical Society on Jan. 18, 1945.

My third axiom is that Science, in order to progress, demands absolute freedom from political control; and since the best part of Medicine, as someone has pointed out, is a by-product of Science, the same freedom must exist for Medicine also. I could, of course, dilate upon this plea for freedom. I will content myself with a quotation from a pungent address given by Herbert Spencer to our American friends some sixty years ago. Remarked Spencer, "One of your early statesmen said 'the price of liberty is eternal vigilance.' But it is far less against foreign aggressions upon . . . liberty that this vigilance is required, than against the insidious growth of domestic interference with liberty." Here is obviously a man who should "be living at this hour."

Society

Neither Medicine nor the State can *make* a man healthy, whether in the "positive" or in any other sense, unless he wills it. And what I said of work and security applies to health and security. Some folk, as we know, are so fit that they are almost a danger to themselves; but the majority must do something to maintain fitness, and many do badly need our guidance and help. But even this laudable function has to be watched nowadays, so much is unloaded on the doctor.

The Medical Women's Federation issued a memorandum two months ago in which I read:

> The Federation holds the view that doctors, while having an obligation to society for the treatment of individual patients, have also a duty to interest and educate public opinion in medico-social questions so that these may be approached with understanding and sympathy.

To which I fully subscribe. But when I read further that these matters concerning which the doctor is to help include

1. A lowering of the standards of honesty and of consideration for others.
2. An increase in delinquency, including juvenile delinquency,
3. A more widespread and growing habit of indulgence in alcohol among young people,
4. The loosening of family ties,
5. Sexual incontinence.
6. The toleration of a low standard of certain types of reading matter and of public entertainment,

I begin to ask myself if we really do Society a good turn by carrying not only the baby but the whole family on our shoulders.

However, we have quite an extensive and a legitimate sphere in helping to keep the fit, fit; in making the near to fit quite fit; and in restoring, if we can, those who fall by the wayside. And we are quite ready to "get on with it" if this is recognised as our legitimate sphere.

The State

The third element which is concerned in achieving Health for the nation is the State. That is, the Commonwealth, or, as we express it (in terms of its custodian and mouthpiece) the Government. In democratic countries, one of which we claim to be, the State is like the Sabbath: the State is made for man, not man for the State. It is the servant of the community. In totalitarian nations on the other hand the citizens exist for the State.

The first function of the State is to keep the ring for the individual, not curtailing his freedom but encouraging it, always provided the exercise of his freedom is not inimical to the welfare of the majority of his fellows. The individual has freedom by right, not by permission of officialdom. His freedom is essential in order that he may do his work, which he does primarily for his own subsistence and satisfaction in life, and then to ensure the same for his family. In so doing he makes his contribution to Society. These are considerations which, as I have already said, apply to doctors as they do to other people.

The wise citizen does not look to the State to provide him with what he needs for his existence and his happiness: these are the result of his own work and foresight: and the wise State—that is, the wise statesman—does not try to give him a false sense of security by letting him think otherwise. What a great chance our statesmen missed when they faced the country with plans for security before plans for work! Man by the sweat of his brow and the tiger by the sweat of his paws (you remember?) finds his food first and gets his security afterwards.

THE PART OF PROTECTOR

Now it is a commonplace that the health of its citizens is a nation's best asset, and in this matter of health the State has a very important and legitimate part to play. This part is first and foremost a protective one.

Certain basic requisites being essential for health, a good Government keeps the ring (I cannot improve the simile) whilst the citizen provides himself with enough of the right food, warmth, and shelter, fresh air and sunlight, some leisure, and reasonable amenities. It keeps the trade routes open for bargains and exchange. It ensures an adequate supply of pure water; it sees to it that the cities are kept clean, and it prevents the spread of communicable diseases. It reduces the liability to accidents in the factories and on the roads. The State also sponsors the mothers upon whom it depends for its supply of citizens and ensures the infant a good chance of survival. It shields the old and the mentally afflicted.

But protection means more than encouragement of the honest citizen in his work; it means also discouragement, even to the point of penalty, of the dishonest citizen, and of the man who profiteers at the cost of his fellow citizens, health and happiness. For example, protection of the citizen means that his food must not be tinkered with to the detriment of its nutrient qualities, and that he must not be intimidated from the hoardings or from his newspaper by suggestions that if he does not swallow this or that nostrum he cannot possibly be fit. Lastly, the State shows its protective function by making Education possible for every child, man, and woman.

As I say, the impact of all this upon the nation's health is very definite: and if we substitute the word Medicine for Health we realise the truth of Virchow's dictum that "Politics is nothing else than Medicine on a large scale." It is right, therefore, that Medicine should infiltrate Politics, but it is disastrous for Politics to attempt to infiltrate Medicine.

THE STATE AND MEDICAL PRACTICE

In regard to those aspects of health of which we hear so much now—Positive Health, Social Health, and Industrial Health—the State should, and does, stake out a considerable claim. And now it proposes to interest itself in Medicine as applied to the individual citizen.

Well, we have been pressing for this for a good many years. We have urged that in this relation the great help which the State can give is in improving the machinery rather than in telling us how we should do our doctoring.

I want to stress the fact that Medicine not only does not question the general aims which are set out in the preamble to the white-paper—it welcomes them. It is necessary to emphasise this because Government spokesmen are presenting their case not only as though the principles concerned were new but also as though we who represent Medicine are laggard in accepting them and require coaxing, or even compulsion, in an attempt to implement them. Only a few months ago, when chairing an inaugural lecture by Professor Mackintosh at the London School of Hygiene, the Minister of Reconstruction said:

> "I understand from the newspapers that certain practitioners in the [medical] profession have some doubts about the condition of their service under the new plan. I beg them not to be unduly fearful. Terms are a matter of negotiation, but the end at which we are aiming cannot be a matter of controversy. The aim is that to every man, woman, and child in this country all that is best in medical science shall be available. . . . The medical profession has a long and glorious career of benevolence in the public service, but in spite of all their best endeavours, there remains in our midst much suffering and physical incapacity which I am given to understand is preventable. Common humanity demands that we should address ourselves to

> this problem and seek and find a solution to it On grounds of sentiment—which are not to be despised—and on grounds of the economic health of the nation we must deal with this issue of physical ill health We cannot afford the loss of capacity or the loss of time that comes from physical disability, and, with great respect I invite practitioners of this great profession to refrain in discussion from anything which brings about that friction that leads to heat rather than to light I invite them to join with those of us who are in public office and who are seeking that the way shall be open to an even larger field for their healing skill The public good must be served and the doers of good must have both opportunity and just reward

I find it difficult not to feel slight irritation when I read a homily like that On the main issue Lord Woolton is preaching to the converted The sentiment is crystal clear, but the methods hinted at are nebulous to a degree Even the professor who delivered the lecture at which the Minister presided contributed only compliments and platitudes He described the white papers on the National Health Service and on Government employment policy as valuable prescriptions from the pharmacy of social medicine ' and exhorted us doctors to be fearless in our devising ready to cast out intolerance and partisan advocacy, unafraid of new plans for cooperative action even when they run counter to traditions

It is obvious that we shall need a good deal of patience with laymen who having little knowledge of doctoring or of Medicine have yet a genuine desire to see both of these harnessed to the chariot of the national health As a specimen of this groping after methods by which to attain an end which everyone regards as highly desirable let me quote from Julian Huxley s *Democracy Marches* (July 1941) Dr Huxley has been speaking about the defects of our health services and of certain war time measures which have gone some way to improve them He goes on to say

> The trend would seem fairly clear It is towards the improvement of environmental agencies of health such as housing and open spaces and of that basis of all positive fitness a really adequate diet towards the incorporation of more and more doctors whole or part time in a public medical service an increased emphasis on prevention, the abolishing of the purely private nursing home, then the extension of the insurance principle to higher income groups and the giving of more facilities for paying patients at hospitals, next, on coordinating more of the different elements in a single unified (but not necessarily uniform) system—both kinds of hospitals general practitioners and specialists some arrangement by which specialists pool their knowledge and make it more generally available at lower fees, and finally the growth of more centres for the encouragement of positive health

Here is, indeed a blunderbuss prescription Let us look at its ingredients

Housing, open spaces and an adequate diet here is obvious and excellent work for the State Incorporating more and more doctors in a public medical service this is what I have called marching the doctors up the hill and marching them down again and kidding yourself' (as children say) that you have improved things Prevention is better than cure agreed ' Abolishing the private nursing home may be linked with giving more facilities for paying patients at hospitals agreed again, Extension of the insurance principle to higher income groups —a matter for the political economists, and one with which I think most of us are in sympathy Anyway Government has decided upo

The next trend

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hospitals, general practitioners and specialists) is

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and if so may b accepted as a good general principl

We pass to the pooling of specialists knowledge and making it more generally available at lower fees In so far as specialist knowledge can be pooled it is to suggest otherwise would be an unjust censure upon a group of men and women to whom the growth of Medicine owes a great deal But there is much in the specialist s contribution that cannot be pooled as documented knowledge You can t document his craftsmanship his technique the way he approaches and deals with a clinical problem, synthesises his observations and arrives at a diagnosis You can watch these things going on and you can make his services much more available than they now are but if he could pool these things of which I have spoken he would cease to be a specialist As for his fees by organising a specialist service based upon regionalised hospitals, specialist fees could be lowered automatically The growth of more centres for the encouragement of positive health ' To this we can surely again say ' agreed

WHAT SHOULD THE STATE DO FOR MEDICINE

Many of us have for a long time stressed two steps which the State might take both of which are long overdue—the regionalisation (and rationalisation) of the hospital services and the inclusion of the dependants of the workers in the National Health Insurance scheme Regionalisation of the hospitals and the setting up of health centres would provide the best possible basis for the organisation of a national consultative service, embracing physicians, surgeons, pathologists, and special department ' men

Another and very important part of our health services in need of State help is the nursing service Beyond taking it for granted that any scheme depends for its success upon an efficient nursing service the white paper is almost mute on this vital subject We have too long paid only lip service to the nursing profession Until the State recognises its duty in relation to the nurses training and makes it possible by adequate grants for the purpose, that the student nurse shall be recognised primarily as a useful citizen in training rather than as merely an employee of the hospital—until this state of the student nurse is recognised and supported recruitment into the profession from girls with the best brains and the keenest natures will continue to lag and efficient nurses will continue to be in short supply This starvation will continue to show itself also in the ranks of the district nursing service, a branch of the profession upon which the country will probably rely more and more in the future

In whatever ways the State decides to advance in the direction of improving our health services it is clear that we shall need more doctors The heavy expenses attaching to the education of doctors must be shared by the State, and in a number of ways—through much larger university grants through subsidies to recognised medical schools through scholarships and bursaries

Then consider research Our millionaires have been most forthcoming and we are grateful to them But there must be a much clearer official recognition of the essential contribution which research makes to the efficiency and progress of Medicine The degree of recognition which research gets at present is reflected in the fact that the white paper disposes of it in thirteen lines, most of which are taken up by saying that the present state of medical research is satisfactory and requires nothing further done about it

THE MACHINE AND THE MAN

I have tried to indicate the main ways in which the State can function in Society's interest *in the field of* Health It will have been seen that all these ways really concentrate upon the *machinery* of Medicine and making it possible for the personnel to be efficient The rest is up to us up to Medicine Our case with the State is surely just this—we say in effect ' If, with our help you will improve the machine whereby *availability* of medical service to every citizen is made possible, we will work the machine in the manner that we know *from* experience to yield the best results But be it noted that we do *not* think (or I should say most of us do *not* think) that if doctors are made *a part of the machine* the same degree of efficiency will follow In other words many—both citizens and doctors—feel that a State medical service is not only an unnecessary innovation but one which is unlikely to give the best results in Medicine in this country Where the public is uncertain it is our bounden duty to convince it of this

When the system of State control prevalent in Russia is held up to us as a model which we might usefully follow it is necessary to remember that the slow evolution of our own health services—many of them quite admirable if only availability were ensured—has been quite different from anything that has happened in Russia; nor must we forget that "bloody revolution" in that country necessitated a re-start from scratch. If any should deny that the white-paper envisages the beginning of a whole-time State medical service—and its political sponsors do deny it—I would remind you that the Left Wing politicians have not only welcomed the white-paper as a useful compromise, but that Mr. Arthur Greenwood said in the House of Commons that he welcomed it as a great contribution towards the kind of plan which, in the fullness of time, his party would like to see established. I believe that the public, when it is really stirred to consider this matter—for up till now it has been complacent, and only mildly intrigued by what it thinks is a squabble between the doctors and the politicians—I believe the people will vote heavily against making all doctors Civil Servants.

Of the many handicaps and restrictions such a system would impose upon Medicine and therefore upon the public, I shall only touch upon two or three.

"Free choice of doctor," for example, has become a familiar slogan, but this would be almost impracticable if all practitioners were State-controlled. In a State service the "black market" in doctoring would be terrific! Then again, that spirit of initiative and adventure to which I referred in dealing with the doctor's personality, and which have always characterised British Medicine, demand a more individual outlook for the doctor than a State service can offer, if men and women with good brains and healthy ambition are still to be attracted to the profession.

The position of the voluntary hospitals under the proposed scheme has been the subject of much discussion and in this connexion the public is showing more awareness concerning the possible dangers ahead. This is no doubt largely due to the prompt action of interested laymen who are responsible for the administration of these great institutions. The future existence of the voluntary hospitals is rendered precarious both because of the form of control suggested in the white-paper and also because of inadequate financial guarantees. But what I specially want to point out here is that the voluntary hospital is the best medium in which that initiative and adventure just spoken of can and do exercise themselves and is the centre from which the most striking advances, both in clinical knowledge and in laboratory research, have radiated. It is also the practical training ground of doctors. If it suffers all these things will suffer with it.

Two Essentials

I said earlier in this address that I believed the essentials in the issue now being settled were few and that we should concentrate upon them. They are really two.

There is the question of control *on the medical side* of all extensions of the health services contemplated by the Government, whether of personnel or of institutions. This control must provide adequate medical representation at the centre and at the periphery upon both the advisory and the executive bodies. It should not be past the wit of the Minister of Health and his colleagues to make this adjustment from the white-paper without sacrificing the constitutional principle that the Minister must be responsible to Parliament for the efficient working of the scheme. There are good examples of this both in the Ministry of Education and the Ministry of Pensions.

The second essential is that the liberty of the doctor, whether general practitioner or consultant, should be preserved. It should not only be *permitted* that a man shall carry on his practice privately if he so desires, he shall be *encouraged* to do so, by seeing that he is not penalised through restricted facilities.

If Medicine is monopolised, or stereotyped, by Government control, a very serious disservice will be done both to Medicine itself and to the community. It is our duty, as I have said, to safeguard these two positions. If, and only if, we can do so, let us help wholeheartedly and pull our entire weight in the service of our fellows.

DEHYDRATION

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WATER accounts for 60% or more of the weight of the adult human body, and a pathological decrease in this amount of water causes profound disturbances of metabolism, of the circulation, and of renal function. In the past ten years, laboratory investigations have made it clear that a distinction exists between dehydration caused by primary loss of water, and dehydration in which the loss of water is secondary to a reduction in the total salt content of the body. The purpose of this paper is to summarise these advances in physiological knowledge, and to discuss their application to the clinical syndrome of dehydration, in which water and salt loss are often combined.

NORMAL INTAKE, OUTPUT, AND DISTRIBUTION OF WATER

The credit side of the water balance is derived from beverages, from water contained even in "dry" foods, and from the water of oxidation of carbohydrates, proteins, and fats. In a temperate climate, 2·5 litres represents an average daily water intake, including 300–400 c.cm. of water from the oxidation of an ordinary mixed diet. Water is lost from the body in the expired air, through the skin by insensible perspiration, in the sweat, and in the fæces and urine. The amounts lost by these various channels depend greatly on the environment, as well as on diurnal changes in fluid intake.

From 200 to 500 c.cm. per day is lost in the expired air, the amount depending on the humidity of the inspired air, and on the pulmonary ventilation, which is increased by exertion, or by breathing a rarefied atmosphere. The daily loss of water through the skin, apart from sweating, is about 500 c.cm.; this is affected mainly by the temperature, humidity, and rate of circulation of the surrounding air. The amount of sweat is determined by exertion and external temperature within very wide limits, from inappreciable amounts up to a litre or more in an hour. Water lost in the fæces, in the absence of diarrhœa, is from 50 to 150 c.cm. per day. The water eliminated in the urine is regulated in volume to compensate for changes in fluid intake, and in the amount of water lost by extrarenal channels. This regulation seems to be mediated very largely by the amount of pituitary anti-diuretic hormone present in the blood-supply to the kidney. The amount of water in the body is kept reasonably constant by variations in the intake in response to thirst, and by variations in the urine volume to counterbalance such changes in the water-loss by skin and lungs as are required to maintain a normal body temperature. The water turnover is greater in the tropics and during physical exertion.

It is convenient to think of the body-water as being distributed in three compartments—the blood-vessels, containing plasma; the tissue spaces, containing interstitial fluid; and the cells, including the red blood-cells, containing intracellular fluid (Gamble 1937). Plasma and interstitial fluid can for some purposes be grouped together, as extracellular fluid. The approximate amounts of fluid in the different compartments in a man weighing 70 kg. are as follows:

	% of body-wt.	*Litres*
Total body fluid	65	46
Plasma	5	3
Interstitial fluid	20	14
Intracellular fluid	40	29

The capillary endothelium and the cell wall, which divide these compartments one from the other, are freely permeable to water itself, which passes from one compartment to another, the direction and magnitude of the transfers being determined by the amount of protein and salts in the various compartments. A dynamic osmotic equilibrium is therefore maintained, in which the total concentration of osmotically active substances, colloids, non-colloids, and ions, is the same in all the compartments, although individual substances may differ in concentration in adjacent compartments. Differences in the concentration of individual dissolved substances depend on the selective permeability of the membranes separating the compartments. The healthy capillary endothelium is relatively impermeable to protein, and plasma differs from interstitial fluid mainly in its high protein content; the minor differences in electrolyte concentration between plasma and interstitial fluid are secondary to the great difference in protein content (Loeb et al. 1922). The cell wall is not freely permeable either to protein, or to sodium, potassium, chloride, or phosphate ions; this makes possible a different electrolyte pattern in extracellular and in intracellular fluid. Extracellular fluid has sodium as the predominant basic ion, with only small amounts of potassium, calcium, and magnesium; chloride is the main anion. Intracellular fluid has potassium as the main cation, and phosphate is the predominant acid radicle, while it is doubtful whether sodium and chloride occur inside tissue cells. Urea is distributed equally through the body-water.

WATER DEFICIENCY

The effects of water deficiency must be studied apart from those of starvation and of salt deficiency. Experiments in which human beings have been given an adequate diet and salt intake, but deprived of as much as possible of their water intake, have been carried out by Wiley and Wiley (1933), Nadal and others (1941), and Black, McCance, and Young (1944). The body-weight begins to fall as soon as the subject stops taking water, and the loss of weight is in fact greater on the first than subsequent days. In 3–4 days of dehydration the weight-loss amounts to about 6% of the body-weight, corresponding to 10% of the body-water. In spite of this considerable weight loss, general symptoms are not severe, although thirst, huskiness, and inability to swallow cause much discomfort. A peculiar pinched and grey appearance of the face makes the subject look worse than he feels. The comparative well-being in pure water-deficiency may be related to the fact that the circulation is well maintained; blood-pressure is normal, the superficial veins are well filled, and the hæmoglobin and hæmatocrit values show no definite increase even on the third or fourth day of water deprivation. Moreover, the diodone clearance, which is a measure of the blood-flow through the kidneys, is not decreased (Black et al. 1942).

There is a moderate rise in blood-urea. When this is compared with the amounts of urea excreted daily before, during, and after the dehydration period, it is found that the amount of urea produced in the body rises during water deprivation, suggesting that body-protein is being broken down more rapidly. Sodium and chloride in the plasma increase by about 10%.

In conformity with this observation, it has been found (Black et al. 1944) that while the water content of the body falls by about 10% the electrolyte and urea content shows a slight increase, so that, distributed evenly over the smaller volume of body-water, it would produce an increase in concentration of the same order as that directly observed. Since the osmotic pressure of the plasma depends on the concentration of its osmotically active constituents, and the plasma is in osmotic equilibrium with the other body-fluids, there must be a progressive rise in the osmotic pressure of the body-fluids during the period of water deprivation. In contrast to the sodium and chloride in plasma, the potassium shows a slight fall, and the urinary excretion of potassium rises during water deprivation (Elkinton and Winkler 1944). As has been mentioned, extracellular fluid has sodium as the main base, and intracellular fluid potassium; it is therefore possible to deduce the proportion of extracellular and intracellular fluid lost from the body, by comparing the sodium and potassium balance after allowance has been made for changes in the blood concentrations. In this way it has been found that about two-thirds of the total water lost is derived from inside the cells: since the body contains about twice as much intracellular as extracellular fluid, the water inside the cells contributes the same proportion of its volume as the water outside, and the loss of fluid is distributed over the whole volume of body-water.

McCance and Young (1944) have studied the secretion of urine during water deprivation. The urine volume falls within 12 hours to about 500 c.cm. per day. The daily volume of urine passed during dehydration is higher when the diet contains normal amounts of salt than when it is poor in salt. Injection of hypertonic solutions of salt or of urea causes a diuresis even during dehydration. The daily urine volume increases slightly as the concentration of urea and electrolytes in the plasma rises. The urea clearance falls as soon as the urine volume becomes low (Chesley 1938), but does not undergo any further fall. The inulin clearance is either normal or slightly diminished. The urine excreted is concentrated, with specific gravity above 1030, weighed solids over 5 g. per 100 c.cm., and osmotic concentration 1000 m. osmols per litre or more. Up to the third or fourth day of water deprivation, there is therefore no evidence of renal failure, and the abnormalities in urinary secretion are those imposed on the kidney by the small volume of water available for urine formation.

SALT DEFICIENCY

Experimental salt deficiency is brought about by forced sweating, with replacement of fluid by distilled water, the diet containing minimal amounts of salt. A full account of the observed changes is given by McCance (1936) in his Goulstonian lectures, and it is enough for our present purpose to outline the fundamental differences between deficiency of water and of salt.

The effects on well-being of salt deficiency are greater than those of a comparable degree of water deficiency. Mental apathy and general exhaustion are more in evidence. The painful cramps of salt deficiency are not found in water deficiency. Circulatory failure is a prominent feature of salt loss, and hæmoconcentration is observed early. Although nitrogen retention is common to both conditions, the plasma electrolytes in salt deficiency are diminished, in striking contrast to the increase in plasma sodium and chloride observed in water deficiency. Excretion of potassium does not increase in pure salt deficiency. The urine volumes in salt deficiency are not so low as those in water deficiency, and the urine is more dilute; the urea clearance is more depressed, especially in relation to the greater volume of urine passed.

In the presence of an absolute deficiency of sodium chloride in the body, it is not possible to maintain the volume of extracellular fluid, and in spite of a free intake of distilled water the amount of water in the body diminishes. The basic difference between primary salt and primary water deficit appears to be that in salt deficiency the whole burden of the fluid loss falls on the extracellular fluid, while in water deficiency both extracellular and intracellular fluid are drawn upon. For any given amount of fluid loss, the effect on plasma volume, and so on circulatory efficiency, will be about three times as great when the fluid loss is due to salt deficiency as when it is due to water deficiency. This accounts for the hæmoconcentration of salt deficiency, and possibly for the renal failure.

CLINICAL DEHYDRATION

Workers in stoke-holds and mines may show primary salt deficiency, while on rafts and in the desert men suffer from a primary water deficiency, usually complicated by relative starvation. But in ordinary clinical practice, where dehydration is caused partly by loss of body fluids which differ in their salt content, and partly by interference with intake of food, chloride, and water, it is not surprising that clear-cut deficiencies are uncommon, and most patients show a fluid imbalance which lies somewhere between water and salt deficiency as studied in isolation in the laboratory. Nevertheless it is of the first importance in each individual case to find out *which deficiency is predominant*; for the physiological changes are very different, and treatment such as hypertonic saline, directed to relieving salt deficiency, would undoubtedly make a patient worse if he was deficient mainly in water.

It is fortunate that a patient's kidneys may possess more discrimination than those who are giving him intravenous fluid therapy, and if a sufficiently large amount of fluid is given *healthy* kidneys can avert many of the dangers of an ill-considered choice of fluid (Peters and Van Slyke 1931). Even so, it is wasteful to give the wrong kind of fluid, for this makes the kidneys perform additional work and use additional fluid in excreting, for example, an unnecessary amount of sodium chloride. It also means that more fluid must be given, and in the case of intravenous therapy the giving of unnecessarily large volumes of fluid carries its own risks. Finally, the kidneys themselves may be functioning imperfectly, and even in health the power to excrete salt has definite limits, especially in infants.

The relevant data in deciding whether a patient is suffering mainly from water deficiency or from salt deficiency are derived from knowledge of the cause of fluid imbalance, from clinical observation, and from such laboratory findings as are readily available.

(*a*) *The cause of fluid imbalance.*—Most clinical dehydration is caused by increased loss of one or more body fluids or excretions, in the presence of a normal or diminished fluid intake. It is obvious that the loss of hypotonic fluids, such as sweat and the moisture of expired air, will tend to cause a water deficiency, while the loss of isotonic fluids (gastric and intestinal secretions, bile, blood plasma) is more likely to cause a salt deficiency, especially since a normal diet contains 2·5 litres of water but only 10 g. of salt, and a "fluid diet" may contain the same or a larger amount of water and a smaller amount of salt. Inability to swallow food and water tends to produce a deficiency of water rather than of salt, but vomiting has the opposite effect. In addition to the external losses of fluid, which can be measured, the possibility of internal shifts of fluid must also be kept in mind. For example, in pneumonia the obvious losses of fluid are in the sweat and in the expired air, both hypotonic; but actually salt deficiency is observed, owing to the loss of chloride into the bronchial exudate.

(*b*) *Clinical observations.*—Many of the clinical features of dehydration are common to both water and salt deficiency—loss of weight, thirst, dryness and wrinkling of the skin, dry tongue, and lowered intraocular tension. Muscular cramps however are characteristic of salt deficiency. Circulatory failure is greater in salt deficiency, with collapsed veins, low blood-pressure, and "dehydration fever" due to diminished skin circulation. The fluid balance chart should be supplemented by at least a mental salt balance; the salt content of fluids taken by mouth or given parenterally should be recorded, and when possible the salt content of the urine.

(*c*) *Laboratory findings.*—The main value of laboratory investigations is in establishing definitely whether the body fluids contain more or less salt than normal, or about the same amount. Laboratory examination is also useful in determining the presence or absence of hæmoconcentration, and in detecting acidosis or alkalosis.

Depending on the facilities available, the amount of salt in the body fluids can be judged approximately by the amount of chloride excreted in the urine, more accurately by estimation of the plasma chloride, and with greatest accuracy by estimation of the serum sodium or total base. The chloride content of the urine can be estimated in the clinical side-room by a drop method with potassium chromate and silver nitrate. In most cases, a low urinary chloride suggests salt deficiency, while a high urinary chloride in conjunction with a low urine volume is a sign that water deficiency predominates. Complete reliance cannot be placed on the urinary findings, however, for anomalous cases occur in which the urine chloride is low, while the plasma chloride is increased (Allott 1939). Estimation of the plasma chloride, while more valuable than the urine chloride, is still not a certain measure of the osmotic state of the body fluids, for changes in the alkali reserve may be attended by changes in the plasma chloride without any alteration in the serum sodium or total base. Sodium forms more than 90% of the total base of extracellular fluid, and can be estimated more rapidly than total base, so the estimation of serum sodium is the method of choice for assessing the salt content of the body fluids.

Hæmoconcentration is detected by observing day-to-day changes in the hæmatocrit, hæmoglobin, or red-cell count, or in the plasma proteins. Intercurrent losses of red cells or of plasma, and antecedent anæmia or hypoproteinæmia must of course be considered in assessing the results of these estimations; similarly, allowance must be made for infusions of blood or plasma. The alkali reserve should be estimated in all cases of dehydration associated with vomiting or diarrhœa, alkali administration, or starvation.

CHOICE OF FLUID AND CONTROL OF TREATMENT

The route of election for all fluid therapy is the alimentary tract, by mouth if possible, if not by duodenal or rectal tube; for fluid given by mouth is better retained than fluid given intravenously, and there is no risk of over-loading the circulation. Parenteral administration of fluid is an emergency measure, to be discontinued as soon as it becomes possible for the patient to take enough fluid in the normal way.

Anæmia and low plasma protein call for treatment by infusion of blood or plasma. The indications and control of such treatment are being defined more closely as work on hæmorrhage and shock proceeds, and they cannot be considered here.

The fluids generally available for the treatment of dehydration per se are water, 5% glucose, 0·45% saline ("half-normal saline"), 0·9% saline ("normal saline"), and hypertonic saline, usually 2%. In general terms, water and 5% glucose are appropriate in treating water deficiency, water being given by mouth or rectum and 5% glucose parenterally. Half-normal saline and normal saline are indicated in mixed water and salt deficiency, the usual type to occur clinically. Half-normal saline has the advantage that it can be given by mouth without producing nausea; it is specially valuable in infants whose powers of salt excretion are limited. Hypertonic saline is of very limited usefulness, in comparison with the other fluids, for it cannot be given by mouth, and it is safely given by vein only in the severest forms of salt deficiency, such as cholera, where several litres of saline fluid are lost in a few hours. The commoner forms of salt deficiency are better treated with normal saline, which contains 9 g. of salt per litre, while most body fluids contain only 6 g. per litre. Treatment should be controlled by the same observations and estimations as are used in making the initial discrimination between water, salt, and mixed water-and-salt deficiency. Any patient receiving intravenous fluids should have a quantitative assessment of his fluid requirements made daily, and fluid for the next 24 hours prescribed with as much care as should be used in sulphonamide or penicillin therapy.

SUMMARY

In water deficiency the urine is concentrated and of low volume, the osmotic pressure of the plasma is high, and in the earlier stages at least there is no hæmoconcentration. In salt deficiency the urine is dilute and there may be polyuria, the osmotic pressure of plasma is low, and there is hæmoconcentration.

In clinical dehydration water and salt are usually both deficient, but in varying degree, and it is still important to assess which deficiency predominates, for treatment appropriate to salt deficiency is quite unsuitable when water is depleted to a greater extent than salt.

In judging the nature of the deficiency present in any given patient, the cause of fluid imbalance must be considered as well as his present clinical state. Additional help is given by estimation of the chloride in urine or plasma, or of the serum sodium.

The appropriate fluids for treating water deficiency are water or 5% glucose, for treating mixed water and salt deficiency normal or half-normal saline, and for treating salt deficiency normal saline, except in the severest cases where hypertonic saline may be required.

I am indebted to the Director of Medical Services in India for permission to publish this paper.

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EXPERIMENTAL NEPHROSCLEROSIS
PREVENTION WITH AMMONIUM CHLORIDE

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[illegible] the basis of experiments with desoxycorticosterone acetate [illegible] nephrosclerosis and hypertension, especially [illegible] to unilaterally nephrectomised animals kep[illegible] (Selye and Hall 19[illegible]) [illegible] renal changes are accompanied by periarteritis nodosa, as well as by cardiac and joint lesions, which resemble those characteristic of rheumatic fever (Selye and Pentz 1943, Selye et al. 1944). On the other hand, it has been shown that exposure to various nonspecific damaging agents (cold, infections, trauma, nervous stimuli, &c.) elicits an adaptation syndrome whose acute stage became known as the "alarm reaction," while its secondary phase is generally described as the "stage of resistance" (Selye 1940). Although the first observations on this adaptation syndrome were made on animals, it has [illegible] human beings react in [illegible] l. 1944). Perhaps [illegible] adaptive defence [illegible] function of the a[illegible] whether chronic overdosage with endogenously produced desoxycortone, or allied corticoid substances, could be the cause of renal hypertension in man.

Experimentally it was demonstrated that chronic exposure to nonspecific damaging agents (especially to cold) produces adrenal cortical enlargement and simultaneously nephrosclerosis with hypertension in the rat (Selye 1944). As it is well known that continuous exposure to stress and strain tends to produce renal hypertension in human beings, it is perhaps not too far fetched to suspect possible ætiological relationships between the above-mentioned types of experimental nephrosclerosis and the corresponding disease of man. In view of these relationships we decided to use the experimental disease *as a test object on which we could assay the possible* [illegible] of various hormones [illegible] procedure we merely [illegible] h proved so successful to Canadian endocrinology some 20 years ago when Banting and Best used the pancreatectomised dog as a test object for the assay of insulin, reasoning that a preparation which would cure experimental diabetes should also prove effective in the corresponding disease of man.

This type of experimentation revealed a short time ago that testosterone tends to antagonise the nephrosclerotic action of desoxycortone (Selye and Rowley 1944); but, in view of the strong virilising effects of testosterone, its clinical applicability is somewhat limited. We therefore continued our search in the hope of finding a therapeutic agent which is active in preventing nephrosclerosis but has no unpleasant side effects. Extensive studies concerning the biochemical changes induced by desoxycortone overdosage in *animals* revealed striking disturbances in the electrolyte metabolism and particularly a well-marked rise in the serum-[illegible]. The theoretical aspects [illegible] tailed description of the [illegible] rted elsewhere. In this [illegible] h to summarise the most salient data which may prove to be of practical interest to the clinician—namely, that ammonium chloride restores the serum Na/Cl ratio towards normal, and at the same time prevents experimental nephrosclerosis in the rat.

EXPERIMENTAL

Six groups of animals were used, each consisting of 10 unilaterally nephrectomised female albino rats weighing 40–60 g. The left kidney was removed in all these cases since earlier experiments (quoted in the introductory part of this paper) had demonstrated that [illegible] the remaining kidney to [illegible] xycortone. All animals [illegible] fox chow."

Groups 1, 2, and 3 were kept on tap water and groups 4, 5, and 6 on 1% NaCl solution. Both drinking fluids [illegible] ed that NaCl increases [illegible] soxycortone and it is [illegible] series of experiments [illegible] rinking water in half of our animals. One group of each series (groups 1 and 4) served as water-treated and salt-treated controls, while every animal in the remaining four groups was given subcutaneous implants of four desoxycortone pellets prepared under a pressure of 150 lb. and weighing 10 mg. each. Groups 2 and 5 r[illegible] the desoxycortone pell[illegible] action of this steroid [illegible] respectively. Groups 3 and 6, on the other hand, were given 0·9% ammonium chloride in addition to the desoxycortone. For group 3 the ammonium chloride solution was made up in t[illegible] NaCl, [illegible] Cl ion[illegible] last group the drinking fluid contained twice the number of Cl ions but the same number of Na ions per c.cm. as groups 4 and 5.

Nine of the ten rats in group 5 died from desoxycortone overdosage during the experiment, mostly with pronounced nephrosclerotic changes. All other animals survived until the 57th day after pellet implantation, at which time they were sacrificed, their blood being taken for chemical analysis, and their kidneys and hearts for histological study. The degree of sclerosis in the kidney and the number of periarteritic (rheumatic ?) nodules in the heart muscle were estimated in each animal and expressed in a scale ranging from "0" to "+++."

The percentual intensity of nephrosclerosis, and cardiac lesions was computed by adding the total number of plusses in each group and then dividing by the number of animals in the group. The resulting figure was then expressed as a percentage of the theoretical maximum of "+++" in all animals of a group. This procedure gives a fair estimate of [illegible] demonstrable lesion as positive.

The weight of the heart and kidney was expressed as a percentage of the body-weight.

The serum Na/Cl ratio was determined by dividing the milliequivalents of Na by the milliequivalents of Cl per 100 c.cm. of serum for each animal and calculating the average for each group. Table I summarises the mean values computed in this manner.

The standard errors are listed with the organ weights and Na/Cl ratios

In confirmation of our previous observations, we see from table I that desoxycortone is more toxic on a high than on a comparatively low NaCl intake (compare groups 2 and 5). Treatment with NH_4Cl prevents the development of pathological changes in the kidney and heart both in the animals kept on tap water (compare groups 2 and 3) and in those receiving salt water (com[illegible] ion is seemingly more [illegible] water, since here the [illegible] ars to be completely counteracted. Yet among the NaCl-treated animals the beneficial effect of the NH_4Cl is perhaps even more dramatic, because in these desoxycortone, unopposed, induced a 90% death-rate which was prevented by the addition of NH_4Cl even though a trace of nephrosclerosis was detectable in 1 of the 10 animals of this group.

Comparing these cardiac and renal lesions with the serum Na/Cl ratio, we note that the highest ratio is in the group having very pronounced pathological organ changes. Unfortunately, all but one of the animals in

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TABLE I—RENAL AND CARDIAC LESIONS IN RELATION TO THE SERUM NA/CL RATIO (FLUID INTAKE AD LIB.)

Group	Treatment	Nephrosclerosis		Cardiac lesions		Heart wt.	Kidney wt.	Av. serum Na/Cl ratio
		% incidence	% intensity	% incidence	% intensity	as % of body-wt.		
1	H_2O	0	0	0	0	0·36 ± 0·01	0·55 ± 0·02	1·40 ± 0·03
2	H_2O + DCA	100	70	70	27	0·57 ± 0·04	0·70 ± 0·02	1·62 ± 0·03
3	H_2O + DCA + 0·9% NH_4Cl	0	0	0	0	0·43 ± 0·02	0·69 ± 0·01	1·51 ± 0·05
4	1% NaCl	0	0	0	0	0·36 ± 0·01	0·62 ± 0·01	1·53 ± 0·03
5	1% NaCl + DCA	(100)	(100)	(100)	(67)	(0·69)	(1·39)	* (see below)
6	1% NaCl + DCA + 0·9% NH_4Cl	10	3	0	0	0·48 ± 0·02	1·08 ± 0·01	1·52 ± 0·05

* In this group all but one animal succumbed in the course of the experiment. The values in parentheses are based on histological examination of the organs in this single rat; its blood was not taken for analysis. DCA = desoxycortone.

TABLE II—RENAL AND CARDIAC LESIONS IN RELATION TO THE SERUM NA/CL RATIO (PAIRED FLUID INTAKE)

1	1% NaCl + DCA	80	50	90	57	0·54 ± 0·02	1·01 ± 0·04	1·73 ± 0·06
2	0·9% NH_4Cl + DCA	10	3	10	3	0·41 ± 0·02	1·04 ± 0·06	1·36 ± 0·04

group 5 succumbed in the course of the experiment, and hence there was not sufficient blood to obtain statistically significant data concerning the ratio in this group. However, even more convincing data concerning the correlation between the pathological changes and the index will be reported in connexion with additional experiments summarised in table II.

It is also evident from table I that NaCl in itself has little, if any, effect on cardiac and renal weight, but that desoxycortone on a high NaCl intake causes an even more pronounced hypertrophy of both these organs than on a low NaCl consumption. Curiously, treatment with NH_4Cl markedly counteracts the cardiac hypertrophy caused by desoxycortone without noticeably influencing the kidney-enlarging effect of this steroid. This action of NH_4Cl appears to be essentially the same in the animals receiving tap water and in those kept on the high NaCl intake.

Histological study of the kidneys (see figs. 1–6) shows that in the groups receiving NH_4Cl the tubular cells are enlarged and apparently hyperplastic, but there is no nephrosclerosis. In many cases light vacuoles appear underneath the free surface of the tubular epithelia. These vacuoles are often enclosed in large cytoplasmic buds which protrude deep into the tubular lumen. The significance of the vacuoles is not quite clear, as yet, and forms the subject of further studies, but the general appearance of the large tubular cells is suggestive of hyperfunction and somewhat reminiscent of the kidney-growth-stimulating or "renotrophic" action of testosterone and other virilising steroids. In any case, it is probable that the absence of nephrosclerotic changes in the NH_4Cl-treated groups is responsible for the comparatively small heart weight in these series. Histologically the cardiac muscle fibres in the two NH_4Cl-treated groups (groups 3 and 6) remain practically normal, while they undergo pronounced hypertrophy in the corresponding desoxycortone-treated groups which received no NH_4Cl (groups 2 and 5). It appears reasonable to assume, as a working hypothesis, that the NH_4Cl inhibited the cardiac hypertrophy merely because it prevented the nephrosclerosis which is normally responsible for the compensatory hypertrophy of the cardiac muscle.

The average fluid intake was measured daily in all groups, and it was found that while desoxycortone increased water intake and diuresis—especially in animals kept on the high NaCl intake—addition of NH_4Cl to the drinking water counteracted this effect. Hence it appeared possible that the beneficial action of NH_4Cl might merely be due to the decreased diuresis occasioned, not necessarily by any paradox antidiuretic effect, but simply by the unwillingness of the animals to take large amounts of solutions containing the ammonium salt.

SECOND EXPERIMENT

In order to prove the specific nephrosclerosis-inhibiting property of NH_4Cl, a second experiment was performed as follows. Two groups of 10 unilaterally nephrectomised, female albino rats weighing 40–60 g. were given subcutaneous implants of three desoxycortone pellets prepared under a pressure of 150 lb. and weighing 10 mg. each. Group 1 received 1% NaCl and group 2 0·9% NH_4Cl as drinking fluids. It will be recalled that these two solutions are equivalent with regard to their Cl ion concentration. Although the animals in the NaCl-treated group again exhibited an increased desire for the ingestion of large quantities of fluid, they were only allowed to drink as much as the rats of group 2 voluntarily took. Hence the total amount of chloride ions consumed was identical in the two groups. This experiment was terminated after 37 days, at which time none of the animals had died from desoxycortone overdosage as yet. After sacrificing the rats, their blood and organs were taken for studies similar to those performed on the previously reported series. Table II sumarises the data obtained.

Perusal of table II clearly indicates that the serum Na/Cl ratio was considerably higher in the group receiving NaCl than in that receiving the same number of Cl ions in the form of NH_4Cl. Correspondingly, the nephrosclerosis and the incidence of cardiac nodules was also much greater in group 1 than in group 2. This observation confirms our belief that the development of pathological lesions due to desoxycortone overdosage is not directly dependent on the urine output or the absolute amount of chloride ingested, but probably on the resulting Na/Cl ratio. It should be emphasised that in this, as in the previous, experiment the total weight of the kidney was not significantly influenced by the NH_4Cl, but the cardiac hypertrophy usually caused by desoxycortone was prevented by this salt in proportion to its nephrosclerosis-inhibiting effect.

It is difficult to express the degree of generalised periarteritis nodosa in a quantitative manner, but vascular lesions of this type were detectable, especially in the mesenteric vessels, in all desoxycortone-treated groups in both experimental series, while such were never observed in any of the animals treated with NH_4Cl in addition to the desoxycortone. It is noteworthy that the absorption of desoxycortone from the pellets was not influenced by NH_4Cl as judged by the weight of the pellets at autopsy. It may, therefore, be said that NH_4Cl proved highly effective as a true pharmacological antagonist of desoxycortone, capable of counteracting the nephrosclerosis as well as the development of cardiac nodules and periarteritis nodosa in all these experiments.

It will be recalled that some time ago Durlacher and colleagues (1942) and Darrow and Miller (1942) expressed the view that the toxic effects of desoxycortone on the heart and kidney may be due to the loss of potassium caused by this compound. This view appeared to receive support from experiments in which they demonstrated that a low potassium diet causes renal enlargement and cardiac changes similar to those elicited by desoxycortone, and that treatment with KCl inhibits these toxic effects presumably by restoring the blood-potassium level. However, at the time these workers performed

MICROSCOPICAL APPEARANCES OF THE KIDNEY

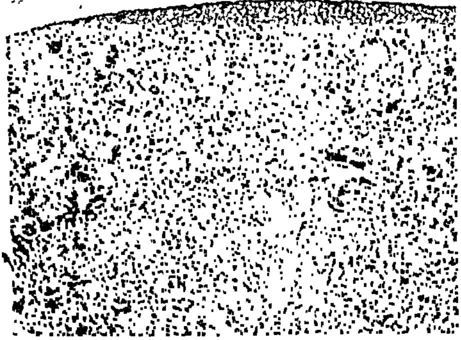

Fig. 1—Normal kidney of a rat of group 1 (receiving water to drink)

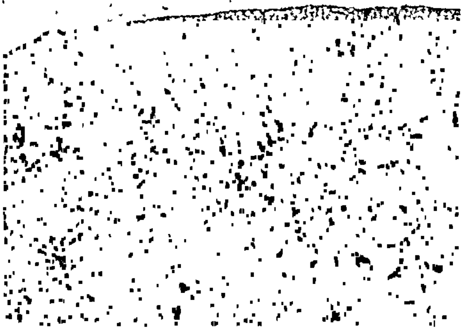

Fig. 2—Kidney of a rat of group 2 (receiving water to drink and treated with desoxycortone). Note numerous distended tubules, some filled with hyaline casts. The arrow points to an enlarged hyalinised glomerulus.

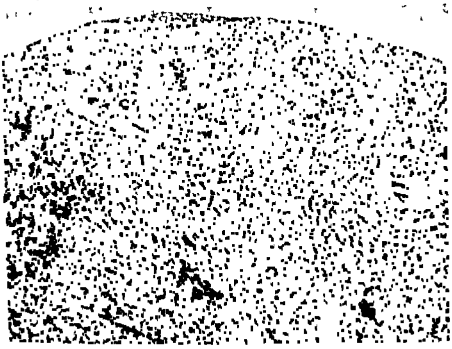

Fig. 3—Kidney of a rat of group 3 (receiving NH_4Cl solution to drink and treated with desoxycortone). Note absence of pathological changes, although tubules are perhaps slightly better developed than in fig 1.

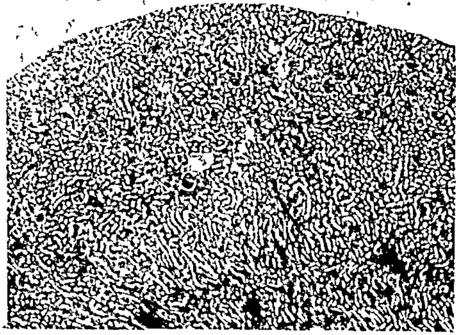

Fig. 4—Normal kidney of a rat of group 4 (receiving NaCl solution to drink)

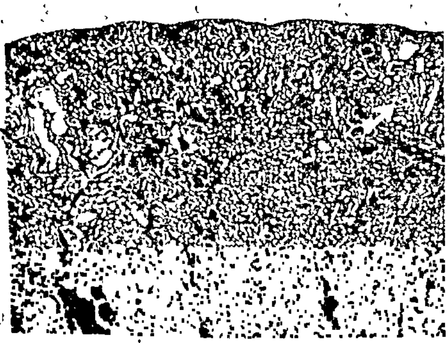

Fig. 5—Kidney of a rat of group 5 (receiving NaCl solution to drink and treated with desoxycortone) Note numerous distended tubules, some filled with hyaline casts. The arrow points to an enlarged hyalinised glomerulus The changes are essentially the same as those in fig. 2.

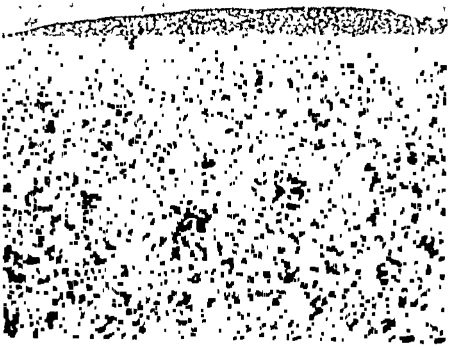

Fig. 6—Kidney of a rat of group 6 (receiving a solution of NaCl and NH_4Cl to drink and treated with desoxycortone) Note absence of pathological changes, although tubules are distinctly better developed than in fig. 4.

their experiments the nephrosclerotic action of desoxycortone was not known. Hence they based their conclusions mainly on the presence or absence of cardiac lesions and the increase in the gross weight of the kidney.

Subsequently, Masson and Beland (1943) repeated these experiments in the mouse, again using renal enlargement as an indicator of desoxycortone overdosage. These latter investigators were unable to confirm the beneficial effect of KCl, inasmuch as treatment with this salt did not prevent the increase in gross kidney weight caused by desoxycortone. Since the mouse is comparatively resistant to the nephrosclerotic action of this steroid, these experiments—like those of Durlacher and others (1942) and Darrow and Miller (1942)—could shed no light on the possible beneficial effect of KCl as an inhibitor of desoxycortone nephrosclerosis. Blood chemical studies on the animals of the present series clearly indicate the lack of any correlation between blood-potassium and nephrosclerosis, in as much as ammonium chloride inhibits the latter without significantly altering the blood-potassium concentration.

We are tempted to ascribe the beneficial action of NH_4Cl to its acid-forming property. Yet it is not inconceivable that chloride ions, given in the form of salts other than NH_4Cl (e.g. KCl), would also be therapeutically effective, not because of their cation but because of their Cl content. Experiments designed to elucidate this point are now under way in this laboratory, but the therapeutic effectiveness of a chloride given as NH_4Cl suggests that the above-mentioned discrepancies are probably due to differences in interpretation rather than in the actual facts observed.

SUMMARY AND CONCLUSIONS

Experiments in the rat indicate that ammonium chloride is highly effective in preventing some of the most serious toxic effects of desoxycortone overdosage. Since there is good reason to believe that nephrosclerosis with renal hypertension, periarteritis nodosa, and perhaps also some of the manifestations of "rheumatic fever" are due to intoxication with excessive amounts of endogenous desoxycortone-like adrenal cortical substances it seems desirable to examine the efficacy of ammonium chloride in patients suffering from such diseases.

This salt may also make it possible to use desoxycortone more extensively as a therapeutic agent in adrenal cortical deficiency without incurring the danger of overdosage. Since this would be merely a new therapeutic application of a time-honoured remedy which has been used in large doses as an expectorant and diuretic, such therapeutic attempts may be undertaken without the usual preoccupation associated with a new drug.

The expenses of this investigation were defrayed by a grant received from the Josiah Macy, jun. Foundation. We are also indebted to Dr. E. Schwenk of the Schering Corporation of Bloomfield, NJ, who supplied the desoxycorticosterone acetate.

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ŒSTRONE SUSPENSIONS.—Œstrogens, being sterols, are relatively insoluble in water, and therefore have to be dissolved in oil for intramuscular injection. It has, however, been found possible to make a watery suspension of œstrone in microcrystalline form which remains stable for a considerable time and when injected intramuscularly has much the effect of implanting a number of very small pellets of the hormone. The suspension prepared by the Laboratories for Applied Biology Ltd., and distributed by Coates & Cooper, Ltd., under the name of 'Micryston,' is stated to contain 1 mg. of microcrystalline œstrone per c.cm., and the number of crystals per c.cm. is estimated as 2×10^6.

REACTION AFTER PNEUMOPERITONEUM TREATMENT

EDWARD ASLETT
M R C S, D P H, D T M & H
TUBERCULOSIS OFFICER, KING EDWARD VII WELSH NATIONAL MEMORIAL ASSOCIATION

T. FRANCIS JARMAN
M D DURH.
ACTING TUBERCULOSIS PHYSICIAN TO THE ASSOCIATION

PNEUMOPERITONEUM has now become fairly generally recognised as a useful adjunct in the management of pulmonary tuberculosis. Its chief value is to enhance the effect of phrenic-nerve interruption by increasing the rise in the paralysed diaphragm (Clifford-Jones and Macdonald 1943). It may also be used to help to control tuberculous lesions immediately after parturition (Barnes 1939). Fowler (1941) considers that pneumoperitoneum alone may be of great value in certain types of bilateral disease.

Though the exact value of pneumoperitoneum has yet to be assessed, it seems likely that it will, for some time at any rate, be increasingly used. We feel therefore that any unusual occurrences during such treatment should be reported.

CASE 1.—A man aged 32. Admitted on March 30, 1943, with bilateral streaky and nodular infiltration, and large and small soft-walled cavities in the upper zone of the left lung. His general condition was only fair. After 6 weeks of strict bed rest there was little improvement and a pneumoperitoneum was induced on May 12 with 400 c.cm. of air. He had three refills, of 400, 500, and 600 c.cm., on May 15, 18, and 25, without any undue discomfort or distress. A fourth refill of 800 c.cm. was given on June 1 at noon. On June 3 at 8 PM he became extremely breathless, the pulse was rapid and weak, and he was distressed and anxious. Breath sounds were exaggerated on both sides, with free movement of the chest. He quickly became collapsed and pale with a sunken appearance and cold extremities, but without definite cyanosis. There were no symptoms or abnormal signs referable to the abdomen. The pulse became progressively more rapid and thready. Oxygen gave some slight relief. Morphine, however, was more effective and afforded some 4–5 hours' sleep during which the respiration and pulse became almost normal. The morphine was repeated with some effect later but he died on June 4, some 24 hours after the onset of symptoms.

CASE 2.—A woman aged 23. Admitted on May 24, 1943, with cavitation in the upper lobe of the right lung and some dense infiltration in the middle lobe; limited fibrotic disease in the upper third of the left lung. Artificial pneumothorax was attempted on the right side but failed because of adhesive pleurisy. Her general condition and the presence of contralateral disease prohibited major measures, such as right thoracoplasty. On Aug. 27 pneumoperitoneum was induced. Thirteen refills varying from 200 to 600 c.cm., according to the appearance on screening, were given. Her general condition showed some improvement, pyrexia lessened, and it was hoped that she might improve sufficiently to allow of major measures. On Feb. 25, 1944, she had a fourteenth refill of 250 c.cm. at 11 AM. On Feb. 26 at 6 PM she complained of slight dyspnœa. Air entry was good on both sides and there was no cyanosis. On Feb. 27 at 10 AM dyspnœa became serious, with distress and some cyanosis. Oxygen gave some relief, but morphine was required. The breath sounds were exaggerated on both sides and the pulse-rate was 160. The pulse grew faster and feeble and she died at 2 PM.

Unfortunately, permission to perform a post-mortem examination was refused in both these cases.

The reactions described appear to have been directly connected with the pneumoperitoneum treatment. It should be emphasised, however, that in both cases fairly widespread bilateral disease contra-indicated preliminary treatment by a phrenic crush. In case 2 the symptoms may have been due to a reduction of vital capacity, though the refill which precipitated them was small (250 c.cm.) and they did not come on immediately. There are many points of similarity in the two cases but it cannot be assumed that both the reactions were the result of similar pathological processes. If reduction in vital capacity was the explanation in case 1, cyanosis rather than pallor might have been expected; the signs were more suggestive of cardiac than of pulmonary embarrassment. Air may have escaped through the diaphragmatic hiatus into the mediastinum, though some emphysema in the tissues at the root of the neck would then be likely, as well as some dysphagia and perhaps a crepitant murmur synchronous with the heart-beat (Clifford Jones and Macdonald 1943).

We have treated 12 cases with fairly advanced bilateral disease by pneumoperitoneum without preliminary phrenic crush. One of these showed a striking improvement which has been maintained since his discharge from hospital and one showed temporary improvement. The others, apart from the 2 fatal cases reported, showed no change for better or worse and the treatment was eventually abandoned.

Pneumoperitoneum may carry a genuine risk in advanced cases with poor general condition. But this should not, we feel, discourage its use in selected cases, especially to enhance the effect of diaphragmatic paralysis where artificial pneumothorax has failed. Of 30 cases of this type treated by phrenic crush followed by pneumoperitoneum, 2 showed a sharp pyrexial reaction after induction and after each of two refills. In 2 others a benign peritoneal effusion developed which completely cleared when pneumoperitoneum treatment was abandoned. In the remaining 26 cases no untoward reactions were encountered.

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PERIARTERITIS NODOSA

POSSIBLY DUE TO SULPHADIAZINE SENSITIVITY

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In the following case of periarteritis nodosa the vascular lesions may have been induced by a hypersensitivity to sulphadiazine. The necropsy report is of special interest because the eyes were subjected to microscopic examination, and information on the ocular lesions in this disease is scanty.

CASE-REPORT

A private, aged 21, was admitted to the hospital on June 24, 1943, for circumcision. Seemed in good health; past history and family history irrelevant; no significant physical abnormalities noted. No laboratory work done before operation. June 26, circumcision was done with 1% procaine local anæsthesia. On the 30th there was a sudden rise of temperature to 101·8° F without apparent explanation. July 2, some dullness with diminished breath sounds and a few crackling râles at right base; sulphadiazine, 1 g. four hourly, started. July 3–4 signs of consolidation in rt. lower lobe; X ray on July 8 showed slight haziness in right base. Fever continued, reaching about 102° F daily. White

of urinary findings and because fever did not respond;

ays, and blood-level had reached

13, patient slightly œdematous;

Heart did not appear enlarged; sounds of fair quality with reduplication of first sound; harsh sound to left of sternum, suggestive of pericardial friction; inconstant presystolic murmur at apex; pulmonary second sound accentuated and systolic murmur heard in this area. An X ray showed clearing of pneumonic process in right base; heart shadow larger than on previous film; transverse diameter of heart 15·5 cm., and of thorax 29·5 cm. Tender in left costovertebral angle. Urine continued to show one plus albumin, numerous white cells, occasional red cells, and granular casts. Red-cell sedimentation-rate 55 mm. per hour. Non-protein nitrogen 45 mg. per 100 c.cm. Electrocardiogram showed normal rhythm; no prolongation of P–R interval; P and T waves upright in leads 1, 2 and 3; P–4 and T–4 slightly inverted. Two blood-cultures negative. Appetite poor; constipated, breath foul. Temperature rose to 102° daily; no chills. July 16: red cells 2,800,000; Hb 65%; white cells 20,000 per c.mm. (52% adult polymorphs, 30% stab cells, 10% lymphocytes). A third blood-culture and urine negative. Urine showed increased albumin and more red cells. On July 20 differential count showed 5% eosinophils and on 25th 8% eosinophils; blood otherwise unchanged. Blood Kahn test negative and smear for malaria showed no parasites.

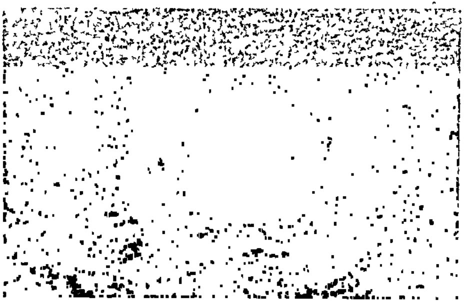

Fig. 1—Subpleural lung arteriole, showing lumen filled by a clot, coagulation necrosis of media, desquamation and disruption of the endothelium and internal elastic lamella, and an intense perivascular leucocytic infiltration (× 160).

During this period patient was dull and depressed, with well-marked pallor. Fever, shifting dullness in abdomen, and varying murmurs at apex and base of heart continued. Lungs normal on physical examination. Ocular fundi normal on repeated examination. Blood-pressure 120/80 mm. Hg. Abdominal distention sufficient to require 'Prostigmin.' July 26, complaining of aching in extremities; no gross evidence of inflammation of joints; slight œdema over shins. Complained of inability to move left arm and hand. Reflexes normal. Received four transfusions of citrated blood at intervals of 4–5 days; liver extract and thiamine parenterally, intravenous dextrose solution, and digitalis in full doses. Developed nausea and vomiting and pulsus bigeminus; digitalis discontinued. Began to complain of severe pain in lower abdomen, which was much distended and tender. Liver and spleen never palpated. Urinary output remained good; urinary findings unchanged. Non-protein nitrogen 46 mg. per 100 c.cm. on July 22; carbon-dioxide combining power 42·8 vol. %; blood-chlorides 379 mg. per 100 c.cm; total plasma-proteins 6·52 mg. (albumin 4·4 mg, globulin 2·0 mg.) per 100 c.cm.

On Aug. 8 was very weak and pale but not complaining. Temperature a little lower. Muscles atrophied, flabby, and tender. No subcutaneous nodules felt. No heart murmurs now heard; heart enlarged to left. Pulse regular. Blood-pressure 140/110 mm. Hg, the highest reading during entire illness. During the latter part of morning began to cry out with pain in abdomen, and suddenly became cold, clammy, and grey. Within few minutes pulse and blood-pressure were not detectable and he died. Duration of illness 40 days, dating from onset of fever after circumcision.

NECROPSY REPORT

Gross examination.—Necropsy performed 1 hr. 20 min. after death. Body emaciated and complexion very sallow. Small lymph-nodes palpated in axillæ and groins. Œdema of hands, feet, and legs. No cutaneous nodules felt.

Abdominal cavity contained 500 c.cm. of pale clear fluid. Multiple greyish-pink firm movable nodules ranging up to 1 cm. in diameter studded entire mesentery; appeared to be enlarged lymph-nodes.

Straw-coloured fluid also found in both pleural cavities, 200 c.cm. in right and about 25 c.cm. in left. Lungs looked normal. Petechial hæmorrhages on both visceral and parietal surfaces of pericardium. Heart weighed 435 g., hypertrophied, and dilated. Epicardium smooth, glistening, transparent, and studded with petechiæ following courses of coronary arteries. Numerous soft and friable yellowish-white areas in myocardium, varied in size and shape, largest 1 × 0·5 × 3 cm. Endocardium overlying these areas dull, reddened, and covered with fibrinous material. No valvular defects noted. Coronary arteries surrounded by greyish-red nodular zones and lumina of smaller radicles seemed shrunken. Aorta showed early atheroma.

Spleen weighed 315 g., large and soft, greyish-red; capsule thin, tense, and smooth; cut surface everted and pulp dark reddish-purple with small irregular greyish-white streaks and nodules scattered throughout.

Liver uniformly enlarged, weighing 2060 g.; mottled red and yellowish-brown, with typical "nutmeg" appearance on cut section, and streaks and nodules as seen in spleen.

Kidneys weighed 310 and 320 g., somewhat larger and softer than normal; surfaces smooth and capsules stripped easily. Cut surface everted and appeared mottled; cortical markings obscured; multiple yellowish-white areas surrounded by reddish-brown margins seen in cortex and medulla of both kidneys, measured up to 1·5 × 1·9 cm. and were rectangular or wedge-shaped. Suprarenal cortex studded with yellowish-white nodules with soft and friable centres. Several small focal hæmorrhages in cortex of each suprarenal gland. Multiple petechiæ found in urinary bladder.

Arterial walls appeared thickened with narrowing of lumina and greyish-pink swollen periarterial zones.

Intestinal tract showed occasional areas of hyperæmia and few small shallow ulcers. Mucosa of cæcum deep red. Tip of appendix deep red, hæmorrhagic, and swollen; mucosa necrotic and bloody fluid filled lumen; serosal surface dull and lustreless.

Brain appeared grossly normal. Eye globes removed in tòto and placed in 10% formalin.

Microscopical examination.—The significant lesion involved vasculature of practically all organs and tissues examined. Secondary lesions included thrombosis and infarction, aneurysmal dilatation with rupture and hæmorrhage, organisation and recanalisation with or without fibrosis, and resultant parenchymatous ischæmic necrosis. Coagulation necrosis, atrophy, and replacement fibrosis were also noted.

Lungs showed areas of œdema, hæmorrhage, engorgement, and dilatation of small venules and capillaries. Smaller arteries and arterioles showed thickening of walls caused by subendothelial increase of collagenous connective tissue. Others showed hyalinisation and fibrinoid degeneration of intima and media with reduplication, fraying, and disruption of internal elastic lamellæ. Intense inflammatory cell infiltration surrounded these arterioles, consisting of polymorph neutrophils, lymphoid cells, plasma cells, mononuclear phagocytic cells, and a goodly number of eosinophils. Muscle-fibres swollen, degenerate, and separated by œdema. Desquamation and disappearance of the endothelial cells and coagulation necrosis of the media involving the entire circumference of some of the vessels was seen (fig. 1).

Sections of *heart* showed multiple hyperæmic vascular scars, definite circumscribed areas of coagulation necrosis, and mural thrombosis with early organisation. Coronary arteries showed well-marked thickening of walls with narrowing of lumina, due to deposition of collagenous connective tissue and fibroblasts as well as reduplication, fraying, and fragmentation of internal elastic lamellæ; well-marked periarterial inflammatory cell infiltration of all types of cells including eosinophils; fibrinoid degeneration, hyalinisation, and replacement of media by proliferated fibroblasts; formation of new capillaries and organisation and recanalisation of thrombi; obliterating endarteritis and marked periarterial fibrosis (fig. 2).

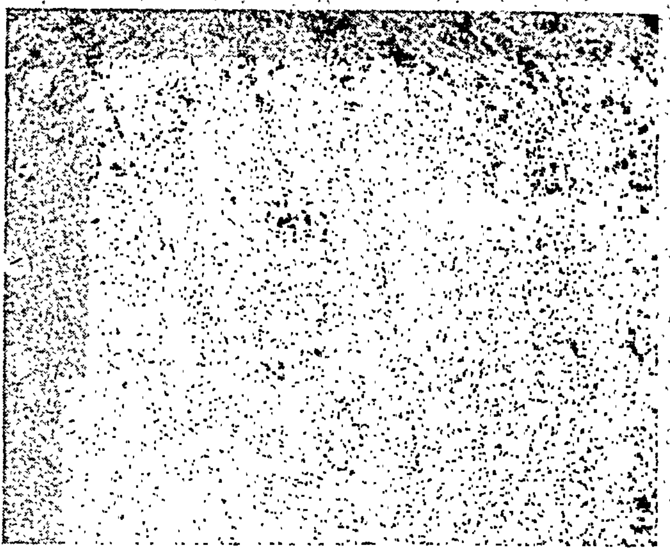

Fig. 2—Subendocardial coronary artery, showing periarterial fibrosis, recanalised thrombus and slight cellular infiltration (× 160).

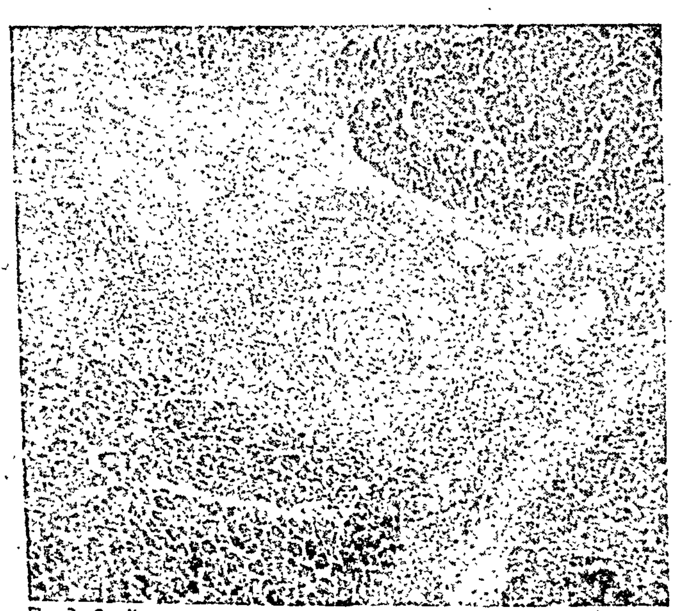

Fig. 3—Small pancreatic artery, showing organised thrombus, periarterial granulation tissue moderately infiltrated with leucocytes and degeneration of the media (× 160).

Kidneys showed areas of recent coagulation necrosis. Glomeruli diffusely swollen, avascular and cellular, containing increased numbers of polymorphs. Spaces of Bowman's capsules contained red cells, fibrin, and desquamated epithelial cells. Tubules degenerate and dilated. Cellular casts common and engorgement of interstitial vessels prominent. Interstitial cellular infiltration was focal.

Spleen: infrequent follicles; sinusoids engorged with red cells; pulp infiltrated with polymorphs, lymphoid cells, and eosinophils. *Liver*: advanced fatty and granular degeneration; focal atrophy and necrosis:

ment of small vessels, especially of central sinusoids. *Pancreas*: arterial changes as elsewhere, including arterial fibrosis, interstitial and perivascular cellular infiltration, and parenchymatous degeneration (fig. 3).

Mesenteric nodes: engorgement of small vessels, reticulo-endothelial hyperplasia, leucocytic infiltration, and proliferation of collagenous tissue in medullary portions; notable scarcity of germinal centres. *Appendix*: typical vascular lesions (fig. 4).

Skeletal muscles: perivascular leucocytic infiltration and degenerative changes of fibres.

Choroid vessels of eyes: minimal vascular lesions.

DISCUSSION

Gruber, in 1925, was the first to suggest that the pathological changes in periarteritis nodosa might be due to a hyperergic reaction in the arterial wall. There have since been numerous reports of people known to be allergic, and demonstrating such symptoms as asthma, who developed periarteritis nodosa (Speigel 1936, Ehrstrom 1938, Weir 1939, Cohen and Kline 1936), suggesting that the profound and permanent arterial changes are due to irreversible allergic reactions similar to the Arthus phenomenon. In many cases of periarteritis nodosa, however, no history of allergic diseases can be obtained.

The observations of Rich and his colleagues (1942a, b, 1943) have lent both experimental and clinical support to the allergic ætiology. In 1941 Rich encountered 4 patients who were treated for pneumonia with serum and sulphonamides, all of whom developed serum sickness and died. They all showed the lesions of periarteritis nodosa, and the following observations led to the belief that this was not a coincidence. First, none of the patients had symptoms suggestive of periarteritis nodosa before admission to hospital for treatment of the pneumonia. Secondly, all had an acute infectious disease, the pneumonia. Thirdly, the vascular lesions were fresh in all instances. Two cases showed fibroblastic changes which were of 3–4 weeks' duration and coincided with the period that they were ill. Rich thought it extremely unlikely that the pneumonic infection itself was an ætiological factor. The view that serum sickness was the cause was supported by an autopsy on a patient who had died of serum sickness and had not received sulphonamides, but who showed the lesions of periarteritis nodosa. Rich also refers to the work of Clark and Kaplan on the vascular changes induced by serum sickness.

The case of a negro of 66 who was admitted to the Johns Hopkins Hospital for malignant ulcer of the scrotum suggests that sensitisation to sulphonamides may be responsible for the development of periarteritis nodosa. A biopsy 5 months before his admission showed no arterial disease. In hospital the patient received sulphathiazole before and after operation. Fever and a mild conjunctivitis developed on the 9th day and the drug was discontinued. However, apparently because of continued fever, the drug was again administered after a 5-day interval. The patient died on the 18th postoperative day. Tissues removed from the scrotum and inguinal lymph-nodes at operation showed no lesions suggestive of periarteritis nodosa, whereas those removed at autopsy revealed extensive and pronounced arterial changes. A more perfect experiment could hardly be devised to demonstrate the cause and effect relationship between the drug reaction and the arterial changes. Its significance is diminished only because it is an isolated example.

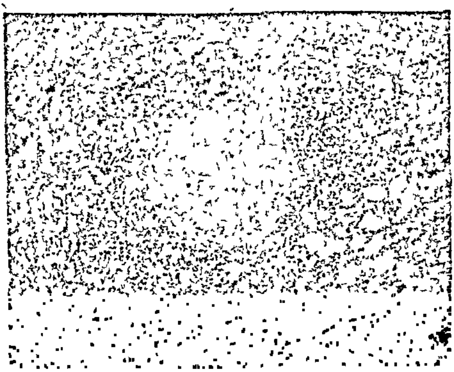

Fig. 4—Submucosal arteriole of appendix, showing organised thrombus, attenuation and degeneration of the media, and periarterial leucocytic infiltration (× 160).

Rich has reported that serum sickness in rabbits is accompanied by arterial lesions very similar to those of periarteritis nodosa. Thus far attempts to induce these vascular changes by the production of drug sensitivity in animals have failed, but further experimentation is in progress (Rich 1942a, b, Rich and Gregory 1943).

The present case possessed most of the cardinal clinical characteristics of periarteritis nodosa, but though the eyes were repeatedly observed ophthalmoscopically by several members of the staff no evidences of arterial disease were noted in the visible retinal arterioles. It appears from this case—and the autopsy findings supported the view—that ocular involvement is not a prominent feature of periarteritis nodosa.

The case-history and X rays of the chest suggest that this patient may not have been suffering from periarteritis nodosa before his febrile illness. The onset of the illness was not different from that of other cases of atypical pneumonia, which were common at the time. There is both clinical and X-ray evidence that his pulmonary lesion was improving during the second week of his disease. There was no antecedent illness suggestive of periarteritis nodosa. The changes in the lungs were less pronounced than in other parts of the body and there were no signs of any extensive vascular accident in the right lower lobe. It is at least possible that the arterial disease was a result of hypersensitivity to sulphadiazine.

Acknowledgment is made to the staff of the medical service of the Evacuation Hospital, on whose service the patient was initially observed. We are indebted to the First Medical General Laboratory and Lieut.-Colonel D. Murray Angevine for the microphotographs.

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— and Gregory, J. S. (1943) *Ibid*, 72, 65.
Speigel, R. (1936) *Arch. intern Med.* 58, 993.
Weir, D. R. (1939) *Amer. J. Path.* 15, 79.

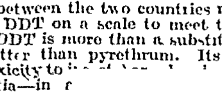
Medical Societies

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE

THE insecticide DDT has received a great deal of publicity, but little of the scientific work on which its reputation depends has been published, at any rate in this country. On Feb. 15 Prof. P. A. BUXTON gave some details of unpublished British work.

DDT in Action

It is now about five years, he said, since the insecticidal powers of DDT were discovered in the laboratories of Messrs. J. R. Geigy, A.G., of Basle. Small samples reached England towards the end of 1942, and some of the early tests here were made in Buxton's department at the London School of Hygiene. The results were astonishing; DDT proved to be lethal to lice and bed bugs at a tenth or less of the concentration required of the thiocyanates, which were among the most potent synthetic insecticides then known. This discovery came at a welcome moment for the Allies, who were experiencing difficulties in obtaining insecticides for controlling insect-borne diseases. The entry of Japan into the war and the occupation of Malaya had deprived us of half the pyrethrum supplies and nearly all the derris: to make matters worse, the 1942 pyrethrum crop in Kenya was a poor one. To reach agreement on the conservation of pyrethrum supplies, a British mission, of which Buxton was a member, went to America early in 1943. DDT was produced as a possible alternative and it transpired that the Americans had likewise made preliminary tests with the same results. Subsequent collaboration between the two countries resulted in the production of DDT on a scale to meet the pyrethrum deficit. But DDT is more than a substitute; in some ways it is better than pyrethrum. Its chief virtues (apart from toxicity to [illegible] and physical inertia—in [illegible] This contrasts with pyrethr[illegible] cidal [illegible] smell. It is practically insoluble in water but dissolves in various organic solvents fairly readily. The initials DDT stand for dichlordiphenyltrichlorethane, or, more precisely 2,2 bis-(*p*-chlorphenyl)-1,1,1, trichlorethane;



If either of the end chlorines is moved into the *ortho* position, the substance becomes almost harmless to insects. Being nearly insoluble in water, DDT has very little smell or taste, so that one could eat large quantities without repugnance; therefore the question of toxicity to man is important.[1] Buxton's conclusion, based on a wide knowledge of its practical application, was that

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[1] See *Lancet* annotation, Feb. 24, 1945, p. 248.

DDT as an insecticide is quite safe. There is no recorded case of human intoxication by DDT despite the thousands of soldiers who have worn impregnated shirts and the considerable number of factory hands concerned with its manufacture and application, on the scale of several tons a day. The substance can penetrate the mammalian skin when in concentrated solution, but cannot do so when dry. Insects however can be fatally poisoned by mere contact with DDT crystals. It is probably also toxic when swallowed by them but this effect is difficult to differentiate from the general poisoning by contact. The symptoms commonly shown by insects are twitching of the legs and lack of coördination; so they cannot walk or fly normally. These characteristic symptoms may persist for some hours before death. DDT has been found to be lethal to all types of insect on which it has been tested. But there may be wide differences in susceptibility. Simple tests in which half a dozen different insects were exposed to dry films of DDT on filter paper indicated a range of 10.001 : 1 in the doses necessary to kill.

For application. DDT can be made up as a powder, as a solution in kerosene or other liquids, or as a dispersion in water, or it can be dissolved in oil and the oil emulsified. The formulation is an important consideration in attacking different pests. For mosquitoes, DDT can be used either against the adult or the larva. For the adults, which are easily killed by it, DDT is a useful component of sprays and aerosols of various types.[1] But perhaps the most promising method is to coat the walls of dwelling houses with a film of about 100 mg. per sq. foot which should remain lethal to mosquitoes for 2–3 months. This seems likely to be the most economical method of controlling malaria in native villages, and the consequences of its widespread use are enormous. In antimalarial oil DDT is toxic to mosquito larvæ at fantastically low rates. Under experimental conditions in West Africa, Buxton found that a tenth of an ounce per acre killed all larvæ (though it had no lasting effect). In practice, this dose has to be increased, to allow for poor distribution and to give some residual toxicity, to about 2–4 oz. Distribution of DDT dust by aeroplane is a novel and spectacular method but one which is of mainly war-time importance. Against houseflies and other muscids such as *Calliphora*, *Lucilia*, *Stomoxys*, and *Glossina*, DDT films are toxic for long periods, and this opens up new possibilities of their control.

For the control of body lice, DDT may be used either in the form of a dust (at 10% in an inert mineral) or to impregnate underwear. The dust was used on a large scale in the Naples typhus epidemic early in 1944 and the successful control of the disease is generally attributed to the insecticide. The simplicity and speed of application by puffing dust under the clothes without troubling to undress people enabled very large numbers to be treated, which was a big factor in the success of the treatment. But this rough and ready method would only be effective with a highly insecticidal dust. A great advance in the protection of armies in the field from lice has been made in this war by the impregnation of underwear with insecticides. DDT is admirable for this purpose, only 1–2% by weight of the garment being necessary. Owing to the insolubility of DDT in water, this "proofing" resists a considerable amount of wear with weekly laundering.

Looking forward to peace-time problems, Buxton said there are many domestic pests which can be attacked with this new insecticide. One of the foremost is the bed bug, which should be prevented from spreading into the new houses which will be built in the post-war years. So far the most promising method seems to be the general spraying of walls and furniture with a 5% solution in kerosene. The amount of DDT deposited should be at least 100 mg. per sq. ft. Field trials as well as laboratory work indicate that this deposit remains lethal to any bugs which may be introduced into a treated room for some three months. Further problems of improving the toxicity and permanence of these films await solution.

SANITARY INSTITUTE.—At a meeting to be held at all, Norwich, at 10.30 AM on Saturday, March 17. Macdonald will speak on food-poisoning.

Reviews of Books

The Surgery of Abdominal Trauma

GEOFFREY E. PARKER, MB CAMB., FRCS, surgeon, French Hospital, London, Woolwich War Memorial Hospital: major RAMC. (Churchill. Pp. 118. 10*s.* 6*d.*)

Major Parker describes 94 cases of abdominal trauma which he has himself treated. The histories are preceded by chapters on diagnosis, preoperative treatment, and general operative considerations, and followed by an account of postoperative treatment and a summary of his impressions. His reports give a stimulating picture of field surgery: something of the atmosphere in which the work was carried out lends colour to a series of useful and informative cases with the high recovery-rate of 66%. He advises that the proctoscope should be used as a routine where there are penetrating injuries of the lower abdomen and buttocks, and he gives useful suggestions for the placing of incisions for exploring the kidneys. The anæsthetist's work has been impressive in these cases, especially his success in maintaining respiration in patients too shocked to do it for themselves. The free use of morphine is considered essential although it may add to difficulties in diagnosis. Fuller discussion of these difficulties would have been welcome, since there is some reason to suppose that in the past they have been exaggerated. For the patient who is bleeding but not ready for operation a slow blood-drip is advocated, to be speeded up as soon as the operation begins. The view that bleeding patients need to have their blood replaced rapidly might have been discussed here; there is a growing opinion that if replacement encourages the bleeding, then the answer is more blood. The 5% glucose-in-water infusions suggested for extreme postoperative thirst might be used more generally: thirst is only one of the undesirable results of giving .5% glucose in saline—that is, about 30 g. of salt in 24 hours in hypertonic solution. This book should prove thoroughly useful.

Vascular Responses in the Extremities of Man

in Health and Disease. DAVID I. ABRAHAMSON, MD, FACP. (Oxford University Press. Pp. 412. 30*s.*)

WORK on the disorders of the peripheral circulation has advanced so fast in the last 15 years that many clinicians have had some difficulty in keeping pace. This comparatively small book, by a triumph of selection and compression, covers the whole field digestibly. The anatomy and physiology of the blood-vessels and their controlling nerves are described, methods of diagnosis are evaluated, and the effects of position, temperature, food, anoxia, effort, and many drugs are discussed in detail. All the known disorders of the peripheral circulation are mentioned, though in this section an elementary clinical knowledge of the subject is assumed in the reader. References are numerous. The book can be recommended to those who want a general review, and will be welcomed also by those who would pursue in detail the study of a single disorder.

Allergy in Practice

SAMUEL FEINBERG, MD, associate professor of medicine and chief of the division of allergy, Northwestern University, Chicago. (Year Book Publishers; H. K. Lewis. Pp. 798. 50*s.*)

Feinberg's 798-page volume is, as he wished to make it, a practical yet not dogmatic exposition of the subject of allergy, detailed enough to be useful yet not too verbose. The essential text is in type of normal size, while controversial matter is in smaller type—the former being suggested for the beginner, the latter for the specialist. The rôle of allergy in most of the specialties is stressed. Two sections are pre-eminent: an account, by Professor Feinberg himself, of allergy due to fungi, which he ranks among the commonest causes of allergic response; and a world-wide survey of the distribution of the important pollens producing hay-fever. Allergic diseases in man, anaphylactic conditions in animals, heredity and constitution, the various allergens, the technique of skin testing, and the preparation of extracts are all discussed, and clinical and therapeutic aspects are ably presented. References are ample and up to date.

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THE LANCET

LONDON. SATURDAY, MARCH 10, 1945

Protein in Illness

In the treatment of grave and acute illness attention is usually focused sharply on the local lesion, and less notice is taken of the general disturbance of metabolism. But the light now being thrown on the intermediate metabolism of protein has demonstrated once again the significance of this background of disease, and our conception of the nutritional needs of the sick is changing. Hitherto the main object of doctors prescribing a diet has generally been to provide enough calories; and the fundamental nportance of protein has often gone unrecognised. ut, whereas deprivation of calories means little iore than loss of unessential fatty tissue, deprivation f protein removes the factor needed for repair.

Recent studies of the effect of burns illustrate this nportance of protein in the diet Loss of protein fter burns can be accounted for in various ways, the wo widest channels of loss being local destruction of issue (with its associated pathological changes) and mysterious aggravation of katabolism. The greatest rastage is from the latter cause, it begins soon after urning and lasts ten days or more **Taylor** et al.[1] iave shown that with a diet of 3000 calories containng 50–100 grammes of protein the total deficit of rotein over seven weeks may amount to 2 kilogrammes. It has been known for some time that reakdown of tissue is much accelerated after burning, ut this phenomenon is not peculiar to burns; it is ilso seen after fractures (**Cuthbertson**[2]). In our ast issue Mr. P. B. **Croft** and Prof. R. A. **Peters** howed that in burnt animals the nitrogen loss can e materially reduced either by giving a diet rich in rotein or by adding to the ordinary diet a relatively small amount of the single sulphur containing aminoacid, methionine. These findings lead them to uggest that trauma results in a clamant demand or methionine, which can only be met by breaking lown tissue protein. The remaining unwanted amino-acids, becoming waste-products, are deaminated and excreted in the urine.

Verification of this feasible explanation of nitrogen loss will open up an attractive field for further investigations, which may be made from different angles. The importance of the amino-acids and their parent protein in conditions other than burns and fractures should not be overlooked. It is well known that increased loss of nitrogen is a constant feature of protein starvation from any cause, and the explanation of this may lie, as **Croft** and **Peters** suggest, in the utilisation of methionine for tissue repair or for detoxication. A more subtle chemistry may, however, be involved; for the variety of conditions in which raised protein katabolism has been observed is very considerable and is becoming greater as investigation extends. **Co Tui** et al.[3] have demonstrated a nitrogen deficit in patients undergoing gastrectomy and emphasise the necessity for maintaining a high intake of protein to correct this. In hæmatemeses and melæna a negative nitrogen balance with azotæmia is a constant finding which has never [illegible] ined, but it is clear that [illegible] he Meulengracht regime [illegible] wrought great improvement in the treatment of this condition. In hepatitis the importance of protein feeding has lately been recognised[4] and here again the essential rôle of methionine is apparent. There is thus a wide variety of conditions associated with destruction of body protein, and where this destruction goes unrecognised and untreated it is likely in time to lead to hypoproteinæmia—insidious in its development but serious in its effects. While therefore the recent advance in knowledge of amino-acids are of fascinating biological interest, they also emphasise in a practical sense a need for vigilance over the diet of the sick, and for more serious attention to the common symptom of anorexia. Failure to take food is only too often considered an unfortunate but inevitable accompaniment of disease. It should be regarded rather as a therapeutic challenge.

The Dressing of Burns

From the earliest times surgeons entrusted with the care of wounds have followed two main schools of thought. There are those who advocate special remedies to be applied frequently, and those who leave the wound alone. The followers of the leave-it-alone school argue that Nature is well fitted to carry out repairs to damaged tissues, and requires only to be left undisturbed to perform her task. The more restless and curious members of the craft like to know what is going on beneath their dressings; how many and what varieties of organisms are present in the wound. And it can safely be assumed that even if their first examinations are negative the bacteriologist will eventually have material for his culture plates. **Miles** and his colleagues,[5] for example, showed early in the war how commonly additional bacteria will be found in a wound after a fortnight or so if serial swabs are taken; and **Miles**[6] has demonstrated by streptococcal typing that these organisms are added after wounding. Admittedly the mere finding of bacteria in a wound swab does not necessarily mean that the wound is clinically infected, but there have been plenty of instances of serious and even fatal infection introduced by repeated dressings. Moreover, as **Ackman** and **Smith**[7] of Montreal point out, contamination is not the only consideration, for frequent dressing changes, particularly by inexperienced hands, may impair the vitality of tissues and interfere with repair processes.

The conservative school have lately received some additional evidence in support of their beliefs. **Dingwall** and **Andrus**[8] were using experimental burns of a uniform type on human volunteers to compare the merits of different local applications. They compared each dressing with a standard "sulfafilm" (10% sulphanilamide with methyl cellulose in a triethanolamine base). They found that as their experience and confidence in their technique increased so did the changes of dressings grow less frequent. At the conclusion of their experiment they could show that the average healing time of burns dressed five times was 13·8 days, whereas for burns whose dressings were changed only once the average healing time was 7·6 days. Their reasons for this difference in the rate of healing are worth quoting. "We feel the reason is twofold: first that removing any dressing, even when there is no obvious adherence to the burned area, undoubtedly disturbs and probably removes some of the extremely friable new epithelium. This occurs because the dressing tends to become incorporated in the lesion. Second, the factor of increased contamination which is cumulative with each dressing change may also interfere with the healing process." This policy of leaving dressings alone clearly depends on good primary treatment. In the case of wounds it means the removal of all dead tissue, so as to avoid bathing the healing tissues in a foul sloughing mass, and so as to reduce the more serious risk of gangrene. In the case of burns it is extremely difficult to remove dead tissue, and this remains one of the chief problems in the treatment of deep burns.

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[1] Taylor, F. H. L., Levenson, S. M., Davidson, C. S., Browder, N. C., Lund, C. C. *Ann. Surg.* 1943 118, 215.

[2] Cuthbertson, D. P. *Brit. J. Surg.* 1936, 23, 505

[3] Co Tui, Wright, A. M., Mulholland, J. H., Barcham, I., Breed, E. S. *Ann. Surg.* 1944, 119, 815.

[4] See *Lancet*, 1944, ii, 721.

[5] Miles, A. A., Schwabacher, H., Cunliffe, A. C., Paterson Ross, J., Spooner, E. T. C., Pilcher, R. S., Wright, J. *Brit med. J.* 1940, ii, 855, 895

[6] Miles, A. A. *Lancet*, 1944, i, 809.

[7] Ackman, D., Smith, F. *Canad med. Ass. J.* 1944, 51, 493.

[8] Dingwall, J. A., Andrus, W. deW. *Ann. Surg.* 1944, 120, 377.

Normally a slough from a moderately deep burn separates in 10–20 days, the process being faster if much pus is present. CONNOR and HARVEY[9] have recently suggested a method for hastening separation. Believing the beneficial action of the pus to be due to its acidity, which increases over a number of days, they sought to hasten the process by lowering the pH in the lesion artificially. To do this they applied dressings of a paste made of starch and pyruvic acid solution at pH 1·9. Changing the dressings every 24 hours, they found in dogs that sloughs from experimental burns that took 10–12 days to separate under plain dressings were completely detached within 72 hours with the pyruvic acid dressing. Furthermore, the tissues underneath looked extremely healthy and skin-grafts placed on them took successfully. They had not then worked out the technique on human burns but reported favourably on a single case. If these claims can be confirmed they will go some way towards solving the problem of treating deep burns. The slough will be separating during the early days while the patient is throwing off the systemic effects of his injury. A few days later skin-grafting should be possible. It is generally agreed that escharotics, such as tannic acid, ordinarily delay the separation of sloughs. Because of this and its toxic effects on the liver, MCCLURE and his colleagues[10] in a paper from the Henry Ford Hospital, Detroit, where tannic acid therapy of burns was first introduced by E. C. DAVIDSON in 1925, tell of the abandonment of this form of treatment in favour of the occlusive pressure dressing. At home, too, the infrequent dressing has found favour; thus in the Glasgow burns unit[11] the primary dressing, after application of the sulphonamide cream, is left untouched for 7–10 or even 12 days unless the affected area is such that some contamination is unavoidable Canada endorses this sound surgical principle, and ACKMAN and SMITH, from a controlled series of wounds and burns, conclude that healing and restoration of function are attained most rapidly with occlusive pressure dressings seldom changed. In their opinion no kind of bacteriostatic outweighs the advantages of non-interference.

Scrub Typhus

MALARIA and the dysenteries have always been, and still are, major medical problems in the military field in the tropics, though the campaigns in the East have demonstrated that they can largely be controlled by efficient sanitary measures, drug prophylaxis, and prompt drug treatment. But another disease has become of comparable importance under the conditions of jungle warfare. This is scrub-typhus, or tsutsugamushi, a rickettsial infection normally of small mammals and conveyed from one to another probably by several species of trombiculid mites. These mites feed on blood only once in their lifetime, during their developmental stage; otherwise they are vegetarians. A *Rickettsia orientalis* infection acquired by a larval mite at its blood meal on an infected rodent persists through the nymphal and adult stages of the female mite and is transmitted through its eggs to a succeeding larval mite. When this second mite takes its blood meal it retransmits the infection to a further vertebrate, which may be man. The method of inoculation, unlike that with louse-borne typhus, is by the actual bite of the mite, which presumably suffers from a septicæmic type of infection, the salivary glands among other organs being invaded by the organisms. The mites gain access to their prospective human hosts when the men are standing, sitting, or lying, either by day or by night, in infested localities; men moving and walking about are less prone to become mite-infested.[1] Scrub-typhus infection tends to be limited to particular areas of country; immediately adjacent localities may be relatively free from it. At the jungle edge near step-banked streams, for instance, scrub-typhus infection may be intense under suitable atmospheric conditions. A temperature of over 65° C is necessary before mites become active and can cause infection.

The host does not at first notice the presence of small mites on his skin, and they rapidly spread over his body. Within a few hours the attachment of many mites, whether infected with scrub-typhus or not, causes "scrub-itch," the mites remaining on the skin gorging for perhaps a couple of days. This scrub-itch varies in severity with the number of infesting mites and the individual reactions of the hosts to their bites. It may extend anywhere on the body and lasts four or five days. The scratching it provokes may result in a secondary infection of the abraded spots. But the incidence of scrub-itch is said not to be invariably synchronous with that of scrub-typhus; indeed on this account one worker[2] suggests that scrub-typhus may be transmitted by larval ixodid ticks. Probably all mites can cause scrub-itch, but those which do so most commonly are not necessarily vectors of scrub-typhus. The bite of a rickettsia-infected mite results in the appearance of a primary sore or eschar, which is found in over half *the cases of scrub-typhus but not in all, enlargement* of lymph-glands, and a maculopapular rash with fever lasting 16–20 days. The mortality from the disease varies. In 600-odd cases in New Guinea[3] between September, 1942, and September, 1943, it was 9·7%. In another series of 200 American cases in the S.W. Pacific area[4] it was 10%; but this figure was regarded as higher than necessary owing to the reluctance of men to enter hospital early. As in the classical louse-borne disease the mortality rises with advancing age.

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[9] Connor, J. G., Harvey, S. C. *Ibid*, p. 362.
[10] McClure, R. D., Lam, C. R., Romence, H. *Ibid*, p. 387.
ies of Burns and Scalds, *Spec. Rep. Ser. med. Res. Coun.*, 1944.

[1] McCulloch, R. N. *Med. J. Aust.* 1944, ii, 543.
[2] Cook, C. E. *Ibid*, 1944, ii, 539.

The present exceptional opportunities for studying large numbers of cases of scrub-typhus have led to a clarification of our knowledge of the disease. Already several forms of supposedly tick-borne typhus—tsutsugamushi, Malayan scrub-fever or rural typhus, and Australian Q fever—have been shown to be mite-borne, and there is growing reason to suspect that much of the reputed tick-typhus encountered throughout India and the Far East is in reality the mite-borne disease, which has some characteristic features differentiating it from the louse-borne, flea-borne, and tick-borne forms though all have much in common. A primary sore is often encountered in tick-borne and mite-borne typhus, in both of which infection results from the bite of the vector; this sore is absent in the louse-borne and flea-borne types, where infection results from the entry through skin abrasions of organisms present in the vector's excreta. A rash developing between the 5th and 8th days of the disease is common to all. In the flea-borne and louse-borne diseases the rash extends centrifugally but does not reach the face, palms, and soles. In the tick-borne disease the extension is centripetal: beginning on the wrists and ankles the rash spreads over the body, including the palms, soles, and scalp, being least definite on the abdomen and face. In the mite-borne disease the rash appears first on the abdomen and chest and extends centrifugally to appear on the face, palms, and soles. In each disease after a few days the rash begins to fade, and it finally vanishes in about a couple of weeks. In general the greater the intensity of the rash the more severe the disease. Common to all the typhus diseases are degenerative changes in the small blood-vessels, particularly those of the skin and central nervous system, with resultant vascular, mental, and neurological symptoms and signs. Toxæmia is profound in all; and each is associated with pulmonary complications. The febrile period in scrub-typhus ranges from under a week in the mildest cases to as long as 40 days in others. The great majority of cases run their course in from 10 days to about 3 weeks, 14–17 days being the most usual duration, while convalescence after an attack is protracted, as it is in the other more severe typhus fevers. In fatal cases the patient as a rule dies in the latter part of the second week.

The Weil-Felix reaction helps in the late diagnosis of scrub-typhus, but the *Proteus OXK* antigen for the test must be carefully chosen. With a satisfactorily agglutinable non-motile smooth strain of *Proteus OXK* the agglutinin curve begins to rise on about the 9th day of the disease and reaches its peak in another 10 days. In most cases it reaches a significant titre by the end of the 2nd week of the disease; 1/125 has been suggested as a safe minimum figure on which to base a diagnosis. High titres are often reached, a figure of 1/50,000 being recorded in the 3rd week of the disease in one case. The level of [illegible] bears no relation to the [illegible] some with very high immune-body response to OXK succumb to the disease, while others with little response may recover, and vice versa. Probably a more specific and satisfactory serological test will prove to be the examination of the agglutinating titre of the serum for rickettsial suspensions. These are less readily maintained and prepared than is the antigen for the Weil-Felix test, and so have been less used in the field.

The incidence of scrub-typhus among troops may be limited by pin-pointing the probable sites of infection of known cases and avoiding these areas. Methods of protecting exposed persons against the attack of mites are being actively investigated; clothing and blankets are being impregnated with insect repellants, such as dimethyl phthalate, which remain active for some weeks after one application. Finally there are good hopes of success with a vaccine now in preparation for the use of our Forces in the East. Treatment unfortunately remains purely palliative and symptomatic; absolute rest from the start of the disease, a liberal fluid intake, and the very best of nursing attention do much to aid the patient, whose recovery, given these, depends substantially on his own efforts. The present Australian and American workers in the field regard sedation as of prime importance and they use even morphine freely to secure rest. They also stress the importance of mental reablement after this debilitating fever—a point appreciated by the older physicians when epidemic typhus was much more general than it is now.

RATIONS AND RELIEF

IN discussing last week possible measures of relief for Europe, we said that Mr. Churchill had rejected the idea of reducing the rations of the British people. On reading *Hansard* it appears that the Government statements were less definite than this suggests. Opening the Commons debate on Feb. 27 the Prime Minister said:

> "I am not prepared to have this island cut below its minimum safety reserves of food and oil, except in cases where sure and speedy replacement can be made. Subject to this, we shall do everything in our power to help the liberated countries."

Speaking on the same day in the debate in the Lords on the needs of liberated Europe Lord Selborne said:

> "There is a generous wish among the British people, who know that they are better off than the liberated territories, to send food and other supplies, including rolling stock, from this country to France. Of course, we have done that and we are doing that, but I should be failing in my duty if I did not remind your Lordships and the public that Britain is fully mobilised, fighting the war, and we cannot part with more than a certain part of our resources without impairing our war effort . . . It is a fact that everybody in this country has had sufficient but nobody has had too much, and the truth is that there is not too much in this country . . . and therefore the quantity of supplies that can be taken from these islands is necessarily very limited."

SIR ALEXANDER HOOD, director-general of Army Medical Services, will deliver the Harveian lecture of the Harveian Society of London at the Royal College of Surgeons, Lincoln's Inn Fields, WC2, on Monday, May 28, at 3.30 P.M. His subject is to be Total Medicine.

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[3] Williams, S. W., Sinclair, A. J. M., Jackson, A. V. *Ibid*, p. 525.

[4] Lipman, B. L., Casey, A. V., Byron, R. A., Evans, E. C. *War Med.* 1944, 6, 304.

Annotations

COUPONS FOR BELTS

ANYONE needing a surgical belt or corset more than 6 inches wide must send with his order a medical certificate, which is reasonable, and three clothing coupons, which is an unjust and unkind imposition. In the early days of clothes rationing most adults had a store to draw on, but in five years seats and elbows wear thin and renewals become a necessity. Most of us now need all the clothing coupons we have got, and if coupons have to go on surgical apparatus we must be that much colder or shabbier. Wearers of abdominal belts, moreover, are likely to need more than the average of new clothes, for they often cannot move actively about to keep themselves warm, and some—those with colostomies or other fistulæ—have special needs because soiled underwear must be changed and laundered frequently. Three coupons may not seem worth mentioning. But belts must be cleaned and repaired, processes which now take weeks instead of days; hence few wearers can manage with a single belt—most need two, and some need three, and the efficient life of a belt is not much more than a year. It is then 6 or 9 coupons that these people may be docked in their first year—unless they are wily, and lucky enough to manage with belts 5¾ inches wide—and 3 or so in subsequent years. As a final injustice belts with pads or chutes are exempted from purchase tax, but if the surgeon orders his patient with severe diverticulosis a belt with no pad the patient will be heavily taxed.

The Board of Trade argues that many surgical belts will serve well as cosmetic corsets, and a mere medical certificate will not stop the keen coupon-saver from taking advantage of any relaxation in the sick man's favour. This may be good reason for insisting (as the Board already insists) on detailed certification, but not for adding annoyance and often real hardship to the lot of a large class of chronic sick.

COLD-AGGLUTININS

WITH proper technique cold-hæmagglutinins can be demonstrated in low titre in almost all normal sera. High titres can often be found in atypical pneumonia, and have been reported in many other conditions, though, especially in the earlier reports, there was confusion between rouleaux formation and true agglutination of red cells. Stats and Wasserman[1] have set out three criteria for cold-agglutination in a given serum—(1) agglutination of red cells of any group and some non-human cells, such as sheep cells, at low temperatures with complete reversal on heating to at most 25° C; (2) complete absorption of the agglutinins with red cells at low temperatures; and (3) release of the agglutinins from cold-agglutinated erythrocytes by raising the temperature to 37° C. Not many reports fulfil all these criteria; nevertheless a good deal has been learnt from them. Cold-agglutination occurs mainly in acute infectious diseases, blood diseases, some parasitic diseases—notably trypanosomiasis—and cirrhosis of the liver. In the infectious cases, acute hæmolytic anæmia, and some cases of chronic hæmolytic anæmia, cold-agglutinins in high titre are only present for a limited time; they appear to be permanently present in some other chronic cases of hæmolytic anæmia, in cirrhosis of the liver, and in some patients with Raynaud's phenomenon. Of the acute infectious fevers, apart from atypical (virus) pneumonia, cold-agglutination has been noted in a few cases of scarlet fever and tonsillitis. Recently Spingarn, Jones, and Owrutsky[2] reported it in infectious mononucleosis, Viswanathan and Natarajan[3] in tropical eosinophilia. The case of paroxysmal hæmoglobinuria needs special mention. Stats and Wasserman point out that cold-hæmagglutination, even when associated with hæmoglobinuria, is not related to the paroxysmal cold hæmoglobinuria of syphilis; they are only superficially similar because cold activates the antibody in each; cold hæmagglutination cases do not give the Donath-Landsteiner cold hæmolysis reaction. In Raynaud's phenomenon there does seem to be an association between the clinical findings and cold-agglutination, since agglutination causes further retardation or even cessation of flow in the already constricted blood-vessels.

It will thus be seen that unusually high titres of cold-agglutinins in the serum occur in several unrelated conditions and will probably be found in more, if sought for. Has this any clinical importance? From an exhaustive study Stats and Wasserman concluded that apart from a few cases of hæmolytic anæmia and Raynaud's phenomenon, cold-agglutination is no more than a laboratory curiosity. This opinion was supported by their inability to show that cold-agglutinins caused any injury to the red blood-cells.

COMMUNITY CENTRES

BRITISH Islanders vary considerably in sociability. Thus Hebrideans like to gather for a ceilidh, while Londoners prefer to keep themselves to themselves. Some villages offer a mad round of concerts, bazaars, and tennis parties; others are a cluster of hermitages. No doubt these differences are dictated in part by the disposition of the inhabitants, but it is also true that in some places the sociable are frustrated by lack of a place to meet each other. They are then driven to make a kind of club of the local public-house, where they stand or sometimes sit, often in drab surroundings, to drink thin war-time ales ungraced by any nourishment, physical or spiritual. The Ministry of Education wishes to see these friendly ones provided for more comfortably, and a report,[1] prepared under the direction of the Minister (though he does not commit himself to every detail in it), recommends education authorities to provide community centres where people can use their leisure well and pleasantly in the company of their neighbours. Much evidence has been taken on the need for such centres, on the methods of running those which already exist, and on the difficult problem of making them self-supporting.

Two kinds of centres are to be found at present. In one type a building or group of buildings provides a meeting-place for unrelated organisations. In the other type, a community association runs the centre, which is used chiefly as a club. The Ministry believes a good centre should serve both needs, catering not only for the gardening society, the bowls club, and the discussion groups, but also for the general social life of the neighbourhood. The report discusses early the importance of the canteen. All witnesses agreed that people like the opportunity of getting light meals in pleasant surroundings, and that this encourages them to use the centre for other purposes. But it must be a competent canteen if it is to be attractive; and though it may depend for much of its success on the voluntary efforts of members, the report suggests that the paid staff should include someone who has the job of running it. Opinions of witnesses differed when the question of a licence to sell alcoholic drinks was raised. Some thought a bar would lower the tone of the place, and attract those who came merely for a drink; others felt that a centre which combined the village hall and the village pub would be ideal. The report sensibly remarks that it is for the community concerned to decide whether they want a bar or not.

A full-time paid warden is needed for any centre which serves not less than 2000 families, as well as a

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D., Wasserman, L. R. *Medicine, Baltimore.* 1943, 22, 363.
rn, C. L., Jones, J. P., Owrutsky, B. *Nav. med. Bull.*, 1944, 43, 77.
than, R., Natarajan, B. *Lancet.* Feb. 3, 1945, p. 148.

[1] Community Centres. HM Stationery Office. Pp. 40. 9*d.*

caretaker, a cleaner, and the canteen manager. Some clerical help may be needed too. The qualifications for a warden are noteworthy: it is not the brilliant dominating figure, the life-and-soul of the party, who makes a good warden, but the "patient fellow, not too anxious to lead, but willing to allow local interests to develop." These interests will include not only drama, hobbies, social evenings, and other forms of recreation, but educational activities, in the form of lectures, discussion groups, and demonstrations. Poultry and rabbit clubs and an allotment section may prove popular, but it is for members to decide what form their activities are to take. Opportunities for outdoor games such as tennis and bowls will be welcome, though this must depend on the site.

As to the cost, the report suggests that education authorities should survey the needs of their areas and include proposals for community centres in their schemes for further education under the Education Act. Once the centre is built, income will be derived from lettings, canteen profits, subscriptions, and profits on dances, whist drives, and other social functions. The education authority will usually contribute towards maintenance and half their expenditure is covered by the Ministry. The report suggests that the authority should meet the warden's salary and the costs of structural maintenance, but that members of the centre should make "the maximum contribution compatible with the general standard of their incomes" towards the cost of running it.

PEPTIC ULCER AND CAFFEINE

THE dyspepsia often associated with over-indulgence in tea has commonly been attributed to the astringent and ferment-precipitating properties of the active tannins always present in the cup. But half a pint of strong tea may easily contain 2 grains of the alkaloid caffeine, which forms the basis of the familiar euphoria and relief from fatigue. Excessive tea-drinking might therefore aggravate some psychosomatic factors of accepted importance in the evolution of chronic peptic ulceration. The local action of caffeine has been studied in many countries—sometimes revealing perplexing inconsistencies. For example, Pincussohn in 1906, using the Pavlov-pouch method in dogs, found that coffee increases the volume and acidity of the gastric secretion; but 22 years later Goldbloom employing the same method could not observe any secretory change whatsoever when caffeine was substituted for crude coffee. The subject is of serious import not only in this country of habitual tea-drinkers but also abroad. It was estimated in 1912 that an average of 10 lb. of coffee and 1 lb. of tea were used annually per head in the United States. The corresponding dose of pure caffeine would be about 2 ounces per person, which would mean an even greater consumption among the adults of the community.

In Chicago Roth, Ivy, and Atkinson[1] have modified the traditional caffeine test-meal technique and have measured not only the rise in gastric acidity but also the total volume of acid secreted. In "normal" subjects caffeine consistently provoked a rise in acidity, volume, and total acid, the increased secretion continuing for about 40 minutes. In ulcer patients the same effect in greater degree was noted, and the increased rate of secretion continued unabated for 2 hours or more. They regard this prolongation of response as characteristic of the action of caffeine in ulcer or ulcer-predisposed people and found it much more pronounced than the lengthened response following alcohol. The mucosal changes induced in the stomach have not been recorded in man, but well-marked hyperæmia of the mucosa followed by cyanosis has been seen in cats receiving caffeine intravenously or by mouth. The addition of caffeine in suitable form to a cat's daily food soon causes widespread gastric ulceration,[2] but not of a type reminiscent of the chronic lesion in man. By the alternate administration of caffeine and histamine such ulceration can be induced in a few hours, histamine being ineffective when given alone. Dragstedt[3] has drawn attention to a cognate synergism in man. He observed that the total secretion of acid provoked by histamine and caffeine in combination is much greater than the sum of the two separate responses. When the action of caffeine is compared with that of actual beverages it is apparent that caffeine is not the sole secretogogue involved. So-called decaffeinated coffee, and even substitutes prepared from roasted cereals, cause similar outpourings of acid, smaller in amount but nevertheless commensurate with the caffeine response. The coffee effect itself probably represents the combined actions of caffeine and of stimulant principles present in the coffee oil, responsible for much of the flavour and aroma. Coffee contains about 15% of oily matter, a mixture of higher fatty acid compounds and lipoid-soluble constituents. After roasting, this oily portion, now called "caffeol," contains considerable amounts of the cyclic aldehyde furfurol, together with irritant pyridines, some valerianic acid, and other compounds.

It has been suggested that alcohol produces its effect on the stomach indirectly by releasing histamine. The same view might be taken of the action of any agent capable of inflicting microchemical trauma, such as the irritant principles of condiments, and the idea could be extended to cover many of the odd constituents of the tea-coffee group of beverages. Whatever their explanation, if the findings and deductions of Roth and his colleagues are accepted, patients with persistent or relapsing peptic ulceration should be advised to restrict their caffeine-containing drinks, to avoid especially any simultaneous use of caffeine and alcohol or condiments, and to be sparing even in their consumption of coffee substitutes.

PATHOLOGY OF CONCUSSION

RECENT years have brought a fuller understanding of the nature of concussion. The careful work of Denny-Brown and Ritchie Russell[4] showed that, in animals, concussion might be unaccompanied by any gross pathological changes; and that, judging by the functional changes observed, the condition was due to transient paralysis of centres in the medulla oblongata. From their negative histological findings, they went so far as to suggest that these functional alterations were unaccompanied by any structural changes in the neurones. The disseminated petechial hæmorrhages, often linked with the name of Duret, who stressed their importance in concussion, must therefore be regarded as an additional and unessential feature resulting from severer grades of trauma. Investigation of the more subtle pathological changes occurring in neurones, particularly the finer shades of chromatolysis, needs rigorous controlling, and obviously—since cadaveric changes also involve chromatolysis—the experimental method is essential. These conditions are fulfilled in a study by Windle, Grant, and Fox[5] who found, in guineapigs, that varying grades of chromatolysis were demonstrable in the tegmental region of the brain-stem, and in the spinal cord. The cells most constantly affected were the large neurones of the red nucleus, and the lateral vestibular nuclei; the basal ganglia and cerebellar cortex were not altered. But the cells of any one group were not equally affected, and the number of neurones lost in post-concussion was probably only a fraction of the number functionally altered at an earlier stage. In one of their control groups the animals were asphyxiated and revived, while in another group hemisectio nof the upper cervical cord was performed. In these groups the resulting chromatolysis in the affected neurones was found to differ from that observed in concussion. both in character and in the time of onset. Petechial hæmorrhages were found only with the severer grades of trauma. Moreover there was no œdema of the brain and no glial reaction in the later stages after concussion.

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[1] Roth, J. A., Ivy, A. C., Atkinson, A. J. *J. Amer. med. Ass* 1944, 126, 814.

[2] Judd, E. S. *Bull. Amer. Coll. Surg.* 1943, 28, 46.

[3] Dragstedt, C. A., Gray, J. S., Lawton, A. H., Ramirez de Arellano, M. *Proc. Soc. exp. Biol. N.Y.* 1940, 43, 26.

[4] Denny-Brown, D., Russell, W. R. *Brain*, 1941, 64, 93.

[5] Windle, W. F., Grant, R. A., Fox, C. A. *Surg. Gynec. Obstet.* 1944, 79, 561.

The localisation of these chromatolytic changes in concussion thus agrees well with the observations of Denny-Brown and Ritchie Russell on the functional disturbance. It may be supposed that, with slight degrees of concussion, the alterations in the neurones are correspondingly trivial and reversible. Severer grades of injury will result in proportionately heavy damage to the neurones, with the ultimate loss of some of them. The frequent complaint of post-concussional giddiness. and sometimes tinnitus, without demonstrable clinical signs is also explained. Lastly the suggestion made by Jefferson [3] that the brain-stem has a good deal to do with the control of consciousness receives further support.

INFECTION FROM DUCK'S EGGS

In his annual report for 1926 the chief medical officer of the Ministry of Health drew attention to the possibility that improperly cooked duck eggs could cause gastro-enteritis. This warning has been repeated many times, and W. M. Scott [4] described several salmonella outbreaks in which duck eggs caused severe and often fatal infections. *Bacterium aertrycke*—or to give it its proper title, *Salmonella typhi-murium*—has caused most of the trouble, but other salmonella types may act in a similar way. Gordon and Buxton [5] have helped to close another link in the chain of evidence against the duck. They describe a case of gastro-enteritis in a man who had a fried duck egg breakfast and died six days later. *Bact. aertrycke* was found in his blood and fæces. Three of the four ducks which supplied his eggs gave serological evidence of *Bact. aertrycke* infection, but the results were variable. Of 16 eggs laid by the ducks, 3 contained the organism; it was isolated 3 times from both yolk and shell, from the ovaries of 2 of the ducks, and from the intestinal tract of the third. There is good evidence, therefore, that the fatal illness and the duck egg breakfast were related to each other; phage-typing of the duck and human strains of *Bact. aertrycke* might have clinched it.

If there is no longer reasonable doubt about the occasional contamination of duck eggs there are still interesting questions to answer. Why. for example. should this particular type of salmonella be apparently so common among ducks while relatively few of the numerous other types are reported ? Gordon and Garside[6] suggest that fluctuation in the agglutinins for *Bact. aertrycke* of duck sera is associated with ovarian activity; and ducks appear to have the antisocial habit of intermittent excretion of the organism. Are ducks the only birds, domestic or wild, in this country which commonly transmit salmonella infections to man ? The hen suffers from infections caused by a considerable number of salmonella types, and recent American work has shown that large epidemics of salmonella infections also occur among turkeys. Wood-pigeons. pheasants. and other birds are also occasionally affected. It is important to ascertain what part domestic fowls play in the spread of these infections and of the many new varieties of salmonella which lately appear to have come to stay with us. There is common ground here for the public-health and veterinary pathologist, and it may well be that the domestic duck will soon have new company in the dock. Meanwhile there is something to be said for the German law which compels duck eggs to be indelibly stamped as such; and for the advice that they should be boiled for at least eight minutes or thoroughly baked.

PENICILLIN-ALBUMIN

In their work on administration of penicillin by mouth, Harwood Little and Lumb [1] found that if penicillin is dissolved in raw egg it will withstand changes of hydrogen-ion concentration which will seriously affect penicillin dissolved in plasma or milk and will destroy solutions in water, saline, or cholesterol. In studying the efficiency of various penicillin mixtures given by mouth after a dose of alkali they concluded that a penicillin-egg mixture was the best; and, in their early experiments at least. it seemed that the blood-serum remained bacteriostatic longer after such a dose than when penicillin is given intramuscularly. We now learn that, at the Squibb Institute in New Brunswick, Chow and McKee [2] have shown that, unlike sulphonamides, penicillin, combined with human serum-albumin, retains its antibiotic activity. The penicillin-albumin mixture can be precipitated in 50% alcohol and thus freed from unbound penicillin, which dissolves. The compound can then be redissolved in water and finally obtained in a dry powder. When given intramuscularly to mice it was more slowly excreted than sodium penicillin. Studies of its stability in acids and alkalis have not yet been published, but from the observations of Little and Lumb we may hope that it will prove more resistant than ordinary penicillin to changes of pH such as it would encounter when given by mouth.

LIBRARY HOSPITALITY

Till the beginning of this year the Royal Society of Medicine placed a limit on the number of times outside visitors were allowed to use its library at 1, Wimpole Street. London. W1. As an experiment. it has temporarily relaxed this restriction, and a room on the second floor has been set aside for the use of visitors. with a member of the staff in attendance to fetch the books and documents they want. Many doctors and scientific workers who need the occasional help of the library have been glad of this facility, and at least until the beginning of June the society will continue its generous policy of the open library door.

The annual meeting of the Association of Surgeons of Great Britain and Ireland will be held at the Royal College of Surgeons. Lincoln's Inn Fields. London, WC2. on Wednesday and Thursday. May 2 and 3. The two main subjects of discussion will be the education of the surgeon (openers : Prof. Ernest Finch. Prof. J. R. Learmonth. Prof. John Kirk, Prof. W. G. Barnard. and Major-General W. H. Ogilvie) and carcinoma of the recto-sigmoid (openers : Mr. R. Scott Mason, Dr. Cuthbert Dukes, and Mr. O. V. Lloyd-Davies).

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1. Little. C. J. H.. Lumb, G. *Lancet*, Feb. 17, 1945, p. 203.
2. Chow. B. F., McKee, C. M. *Science*, Jan. 19, 1945. p. 67.

An advance party of Unrra personnel has arrived in Yugoslavia as part of a mission to Yugoslav relief authorities. Military-liaison relief supplies are arriving on the Dalmatian coast, and about 150 tons (95% food and the rest medical stores and clothing) entered the country in the first half of February. The United States government is allowing the release of a limited amount of shipping to Unrra for transporting civilian relief supplies for Italy. Czechoslovakia, and Poland. In Czechoslovakia these supplies will be issued by the government. under whose direction an Unrra mission will work.

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ason, G. *Brit. med. J.* 1944, i, 1.
W. M. *J. Path. Bact.* 1932, 35. 655.
R. F., Buxton, A. *Bull. Min. Hlth emerg. publ. Hlth Serv.* February, 1945, p. 46.
, R. F., Garside. J. S. *J. comp. Path.* 1944, 54, 61.

Special Articles

FRANCE TODAY

(FROM OUR SPECIAL CORRESPONDENT)

(*Concluded from p. 283*)

THE black-market trade in food in Paris is being very vigorously fought; but with limited supplies and the distribution of an insufficient ration of necessities it is a very hard battle. And the French peasants are more and more unwilling to sell their produce except at very high prices, for they find it difficult to buy any of the consumer goods they require. It is rumoured that many peasants, and many people operating in the black market, have such large collections of 1000-franc notes (worth £4 at the fixed exchange) that they do not reckon them in numbers but by weight in kilogrammes.

What part the black market plays in supplying the ordinary needs of ordinary workers in Paris is not at all easy to estimate. But a man is not debarred from buying in the black market because he has a low monthly wage or salary. In fact many people go into the black market as sellers in order to be able to meet their requirements as purchasers. If anyone in Paris can get supplies of food from the country districts by any means—such for instance as being the friend of a motor-truck driver or a railway employee—he can sell anything he has to offer at black-market prices. The underground channels of black-market trade were very useful during the German occupation. Channels of that trade, whether the same or new ones I do not know, certainly exist now.

When such elementary human needs as fresh food for small children—e.g., eggs and milk—and potatoes and vegetables for ordinary household consumption can only be got under the black-market counter, the incentive to make these purchases is as strong as human motives can be. Hence black-market trade is not by any means one which supplies luxuries only. Luxury restaurants giving illicit meals at fantastic prices can be closed. Night-clubs can be closed. But it is not possible to close all the avenues of trade by which a mother or father wanting to supply his family will seek to get necessary food, fuel, or clothing. Black-market trading is simply trading at inflated prices because commodities are so scarce and human need so great. The pressure of inflation on the French currency so caused is very grave. The fixed Anglo-French rate of exchange is 200 francs to the £, but the *bourse noire* rate goes up above 600 francs. Pounds and dollars are preferred by many French people to 1000-franc notes. The danger of serious inflation is a real one, with all the consequences of economic disorganisation which might follow.

For these economic reasons, which would have big repercussions on this country, as well as because of the physical needs of the French people, relief and rehabilitation measures are urgently needed on a very large scale.

Sampling Nutrition

It is so hard to discover the conditions in France by a study of statistics that I made some random samplings of groups of population, by personal inspection, to try to get a clearer idea of the actual state of affairs.

One random sampling was a visit to a school. The school was chosen for me by an official of the Department of the Seine according to my request that it should be not a very good school and not a very bad school, but just a quite ordinary school. I trusted my friend to be impartial in his choice, and to the best of my belief he was.

The school chosen was in a part of Paris in which there was a mixed population of middle-class and manual workers. It was a school having a thousand pupils, boys, girls, and infants, and I visited it at the time when a school meal was being served. The week's menus of the meal are shown below.

Jan. 22: Potage crémosine; pâtes; fromage.
Jan. 23: Potage crémosine; œufs; pommes-de-terre en salade; biscuits.
Jan. 24: Potage crémosine; légumes divers braisés; fromage.
Jan. 25: Potage légumes; légumes divers braisés; confiture.
Jan. 26: Potage légumes; bœuf braisé, haricots.
Jan. 27: Potage légumes; bœuf bourguignon, pommes purée.

Besides the food supplied, the school-children brought their own ration of bread, a few brought apples (the only fresh fruit I saw), and a few brought additional pieces of meat already cooked. The major part of the food was vegetables, and the meat supplied on two days a week was a very small quantity indeed. The cheese was a small portion.

The children whom I saw at their meal were in fair condition and were less than a quarter of the total in attendance, the larger number having their food in their own homes. Those taking the school meal were doing so for a variety of reasons—the distance of their homes from the school, the absence of their parents from home because they were at work, and occasionally the poor social circumstances of the parents. One child whose ruddy cheeks and air of well-being attracted my attention had had a pneumothorax operation and had recently been discharged from a sanatorium after a long stay. Some few of the children were very pale and some ailing. They had the general appearance of children in a poor London school in the period between the wars.

Another sample chosen was the workers in an engineering works employing 900 people (100 of whom were women) in the suburbs of Paris. Because of shortage of raw materials for its work, which it could not get because of transport difficulties, the factory was only producing a part of its normal output. There was a canteen in the factory. Workers were getting the highest amounts of rations but were considerably below the physical standard of men and women such as I have seen recently in works carrying out similar operations in England.

A third sample was in a government office employing 120 staff. There was no heating of any kind in the office and no canteen. The day of my visit was one when the temperature was well below freezing-point. Some workers of the staff I saw looked ill. Of the 120, 60 were absent from work owing to minor ailments incidental to the cold weather and general conditions. These workers were less well nourished than the factory workers I saw. All of them (as was usual in Paris everywhere) wore overcoats, hats, and mufflers while at work.

General Condition of the People

Journeys in the Paris Metro—the universal means of travel, since there are no buses, and taxis are not available—gave me much the same general impression. There are a few expensively dressed people in Paris; but few. Most women on the Metro were without hats, or with a scarf over the hair; their clothes were tidy, but men and women were very shabby even by London war-time standards.

When I went to Brussels from Paris the general condition of the people there seemed much the same. But when I left Brussels after some days, during which I spent much time in the city and saw a very large number of people in streets, tramcars, shops, offices, and private houses, I brought back with me a picture of the people very clear and definite. People in France and Belgium are in appearance, and judging by statistics, definitely below the physical standard of people in London or Manchester or Birmingham.

My return from Brussels by air took about two hours. Very soon afterwards I was in the London Underground among the usual London crowd. The impression the

Londoner gave me was of being robustly better fed, higher-coloured, and more vigorous than the people I had been seeing in France and Belgium, and I have no doubt that the impression conveyed the truth.

France has suffered, as Belgium has suffered, very seriously from the period of occupation by the Germans. The partial paralysis of social and economic life caused by the disastrous breakdown of transport is one main reason for the continuance of this suffering. But unless very active and rapid measures are taken for relief and rehabilitation the suffering will be prolonged and its physical effects very greatly increased.

GENERAL MEDICAL COUNCIL

PENAL CASES

Sir HERBERT EASON, the president, took the chair at the session of the General Medical Council which opened on Feb. 27. Two new members joined the council: Prof. Henry Cohen as a Crown nominee, and Prof. W. J. Tulloch as representative of the University of St. Andrews, both appointed for five years.

DANGEROUS DRUGS

The case of *David Davidson Watson*, registered as c/o Graham, Colquhoun Street, Stirling, MB ST. AND. (1926). Dr. Watson had been convicted on Sept. 14, 1944, at the sheriff's court at Stirling, of procuring for himself, and for other persons by means of prescriptions, dangerous drugs, and was sentenced to a fine of £50 or three months' imprisonment. He appeared without a legal representative.

Mr. F. P. Winterbotham, the council's solicitor, said that Dr. Watson admitted two previous appearances before the council. In May, 1936, the charge was conviction of driving a car while under the influence of drink, and manslaughter, for which he had been sentenced to imprisonment; his name had been erased from the Register but later restored. Later his authority to obtain and use dangerous drugs had been withdrawn. In May, 1944, an examination of chemists' records had shown that he had ordered for himself and certain patients solutions containing cocaine to be used as eye drops or ear lotion.

Dr. Watson, giving evidence in his own defence, said that he had been working as assistant to another practitioner. Finding it necessary to prescribe these solutions, which contained very small quantities of cocaine, he had referred to the British Pharmacopœia, which had stated that the solutions came under the Pharmacy and Poisons Act but not under the Dangerous Drugs Acts. One Edinburgh and three Stirling chemists whom he had consulted had confirmed this statement. It had appeared during the prosecution that until recently these solutions had been specifically excepted from the Dangerous Drugs Acts, but in 1942 had been brought under them by a departmental regulation which had not come to his or the chemists' attention.

In answer to the President, he admitted that he had taken drugs in 1931 when suffering from severe psoriasis, but said that after his cure he had completely abandoned their use. On the present occasion he had behaved quite openly and had not made the smallest attempt at deception. He submitted a testimonial from his principal.

The PRESIDENT delivered a stern warning against the conduct disclosed by the conviction, and stated that judgment would be postponed for two years, after which time Dr. Watson would have to appear again before the council and submit evidence of good behaviour and character.

The case of *Francis Christopher Toner*, registered as of 4, Nun's Island, Galway, MB NUI (1931). Dr. Toner came before the council from prison, where he is serving a sentence of twelve months without hard labour. Mr. Winterbotham proved that he had been convicted four times before petty sessions of offences against the Dangerous Drugs Acts. The latest conviction, after which he had been imprisoned, was for unlawfully procuring tincture of opium on four occasions. He had decl [illegible] a written statement to the council that his [illegible] work had never been affected by his ad- [illegible] that the offences had not been committed [illegible] been professionally engaged. He asked the council to deal with him leniently, and produced a letter from the medical officer of Lincoln Prison saying that his health was satisfactory and he was cooperating in his treatment. The council, however, ordered his name to be erased from the Register.

MISUSE OF ALCOHOL

The case of *Alexander Lawrie*, registered as of 113, Manchester Road, Accrington, Lancs, MB EDIN. (1932). He had been convicted in August, 1944, of twice driving a motor-car while under the influence of drink. In his defence he said that he had been away from his practice for four years and the task of reconstructing it had caused him severe anxiety. Judgment was postponed for two years, subject to the usual provisos of good conduct in the interval and satisfactory evidence of conduct and character at the end of the period.

The case of *Christopher Whitehead*, registered as of Greystone, Co. Wicklow, LRCPI (1926), who had been convicted in May, 1944, of driving a motor-car while incapable through drink of controlling it properly. Mr. A. A. Pereira, of counsel, who appeared on his behalf (instructed by Messrs. Donald, Darlington & Knight), pleaded for leniency on the ground of the respondent's recent domestic trouble. The President announced that judgment in this case also would be postponed for two years, but that if the respondent was convicted again in the interval, his name would be forthwith erased.

INTERNATIONAL SLUM CLEARANCE AT SEA

PAST EFFORT AND PRESENT NEED

INTERNATIONAL agreements on health and labour conditions have a happier history than most others. The League of Nations, if by nothing else, justified its existence by its international health and labour organisations. Another outstanding example has been the International Sanitary Convention (1926) for the prevention of the spread by sea of the graver infectious diseases—plague, typhus, yellow fever, smallpox, and cholera. The coming of the present war has prevented any final estimate of the merits of the corresponding agreement affecting air transport, concluded in 1938.

The Joint Maritime Commission of the International Labour Office, consisting of representatives of shipowners and seafarers, has been meeting in London, and the opening addresses of Mr. Ernest Bevin, Minister of Labour, and by Mr. P. Noel-Baker, of the Ministry of War Transport, once more emphasised the necessity for international agreements. Mr. Bevin spoke of the necessity for reaching agreement on an improved standard of accommodation for seamen on board ship. He was anxious, he said, to see the standard reviewed, not only for seamen of the Western nations but for those from the East also. He believed that where a thing could be done internationally it ought to be done that way, and he saw no reason why the principal maritime countries should not come together with a technical body and lay down the best minimum designs so that naval architects might always have those designs before them.

We trust Mr. Bevin's wise suggestions will be quickly and vigorously followed up. Nowhere will they receive greater attention than among members of the Association of Port Health Authorities of the British Isles, which since the turn of the century have laboured for the hygienic betterment of crew spaces.

THE REFORMERS

In 1902 Dr. W. Collingridge pointed out that the sanitary state of ships was 50 years behind that of the rest of the country. In 1910 Dr. Howard Jones showed that we had lost our pride of place and were no longer the pattern of sanitation at sea. In 1911 Dr. Herbert Williams, successor of Collingridge at the Port of London, wrote that the conditions under which seamen in vessels lived were particularly favourable for the dissemination of pulmonary tuberculosis, and that until the legislature took some more practical interest in the welfare of seamen, pulmonary tuberculosis would continue to be a cause of much mortality amongst this class of men. In the same year the council of the Royal Sanitary Institute, at the instigation of port medical officers, urged the President of the Board of Trade to require a thorough revision of the regulations respecting living quarters for officers and men of all new vessels built under their supervision.

Howard Jones in 1913, 1915, 1920, and 1921, and Dearden of Manchester in 1928, 1929, and 1930 returned to the subject in strong terms. In 1926 Fleet-Surgeon W. E. Home, deploring the lack of hygienic care of seamen, demanded that it should be taken over by the Ministry of Health. In 1922 and again in 1935 the Association of Port Health Authorities published recommendations as to the Hygiene of Crew Spaces, the most far-seeing of which was that in plans of new ships the accommodation proposed for officers and crews should be approved by a committee of which one or more member should be a medical sanitarian with special knowlege of marine hygiene.

In 1930 the port medical officer of health of Liverpool described the inspection of two ships, one foreign "in which the dominant note was one of comfort and cleanliness due to the care and imagination in planning and turnishing" and one British which "was noteworthy only by the fact that the quarters so closely resembled those provided for the crew in British ships 20 or 30 years ago." Similar condemnations of British ships visiting the ports of Hull and Cardiff at this time were also published, the Cardiff observations being included in a paper in these columns by Dr. Greenwood Wilson which [illegible] Clearance at Sea the [illegible] living accommodation [illegible] he continuing need for such efforts as shown by the grave occupational risk to seafarers of pulmonary tuberculosis.

OFFICIAL ACTION

In 1937 the Board of Trade brought out its Instructions to Surveyors on the construction of living quarters for masters and crews in new merchant ships. Plans of new vessels henceforth had to be submitted to and approved by the Board of Trade before the shipbuilders could proceed to build them, although the Port Health Association's desire for such approval to be informed by expert medical advice is still not conceded. The principal improvements were in ventilation and lighting, and in the provision of central heating, drying rooms, heated and improved washplaces, separate messrooms, oilskin lockers, metal food lockers and wardrobes (separate for each individual), and proper water-closets. Dr. S. A. B. Black[1] concludes, from his recent survey of 60 British vessels built at various times during the past thirty years and including 21 built during the past four years, that the 1937 Instructions fall short of what is needed because they do not require medical vetting of ships' plans, the space standards are still not good enough, because their wording has a certain vagueness, and because they are not enforced rigorously enough. The seafarer has also to be persuaded to make good use of and not to abuse his improved quarters.

In so far as this could be achieved in war-time, it has been by the working of the National Maritime Board Agreement published in 1939—the fruit of the labours of a joint committee set up by the Shipping Federation, the National Union of Seamen, and the officers' societies. The effect of this agreement has been increasingly supplemented by local welfare committees set up since 1940 at all principal ports by the Seamen's Welfare Board of the Ministry of Labour, whose beneficent activities have included representation on a committee appointed jointly with the Ministry of Health and the Ministry of War Transport to consider the welfare of the mercantile marine.

Among the recommendations placed before the Joint Committee have been some interesting ones from the Association of Port Health Authorities as to improved dietaries, with better arrangements for storing, cooking, and serving food; as to pre-employment preventive inoculation and vaccination; as to an improved system of medical examination; and as to the employment on ships of sick-bay-steward-health-educationists. The same three Ministries have also had before them lately, with the strong backing of the Association of Port Health Authorities, recommendations by Sir Alexander Macgregor from the port of Glasgow to the effect that any Government scheme for a [illegible] include special provision [illegible] merchant seamen at the [illegible] between the health and welfare elements.

FURTHER OPPORTUNITY

It is in keeping with the spirit of the time to try to apply such benefits to seamen of all nations in respect both of "slum clearance at sea" and also of health and welfare services at sea and at ports. Perhaps the Association of Port Health Authorities of the British Isles will eventually have to become the International Association of Port Health Authorities. Meanwhile, in following Mr. Bevin's lead no opportunity should be lost of consultation with a body which has an admirable record of active endeavour on behalf of merchant seamen.

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[1] *Publ. Hlth*, January, 1945, p 40.

On Active Service

CASUALTIES

DIED

Lieut.-Colonel Martin Patrick Conroy, MB NUI, IAMC
Lieutenant C. G. Cox, IAMC

WOUNDED

Captain A. R. Elsom, MRCS, RAMC
Captain T. M. Rowatt, MB EDIN., RAMC
Lieut.-Colonel R. B. Wright, OBE, RAMC

AWARDS

CB

Major-General W. C. Hartgill, OBE, MC, MRCS, late RAMC

SECOND BAR TO DSO

Brigadier H. L. Glyn Hughes, CBE, DSO, MC, MRCS, RAMC

OBE

Lieut.-Colonel B. W. Rycroft, FRCS, DOMS, RAMC

MBE

Captain T. B. McMurray, MB LPOOL, RAMC

MENTIONED IN DESPATCHES

Surgeon Lieut.-Commander R. N. Martin, MB BELF., RNVR
Brigadier R. A. Hepple, OBE, MC, MB EDIN., late RAMC
Colonel Thomas Menzies, OBE, MB ABERD., RAMC
Colonel Thomas Young, MB GLASG., RAMC
Lieut.-Colonel J. P. Parkinson, MB DURH., RAMC
Lieut.-Colonel D. L. Owen, MB EDIN., RAMC
Major L. S. Rogers, MBE, MB NZ, RAMC
Major O. S. Williams, MRCS, RAMC
Captain D. Collins, LRCPI, RAMC
Captain J. R. Rickett, MRCS, RAMC

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED FEB. 21

[illegible] measles (excluding rubella), 23,216; pneumonia (primary or influenzal), 1118; puerperal pyrexia, 153; cerebrospinal fever, 76; poliomyelitis, [illegible] 3; [illegible] of [illegible] week.

The [illegible] of the [illegible] previous [illegible] diphth[illegible]

Deaths.—In 126 great towns there were no deaths from scarlet fever, 21 (2) from measles, 6 (0) from whooping-cough, 8 (0) from diphtheria, 52 (8) from diarrhœa and enteritis under two years, and 31 (1) from influenza. The figures in parentheses are those for London itself.

London and Greater London each reported 2 deaths from enteric fevers. There were 6 fatal cases of diarrhœa at Birmingham.

The number of stillbirths notified during the week was 102 (corresponding to a rate of 27 per thousand total births), including 17 in London.

In England Now

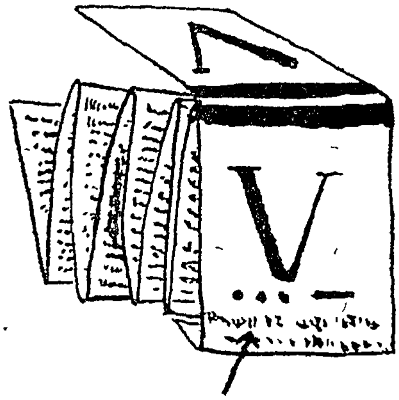
A Running Commentary by Peripatetic Correspondents

HERE is the text of a propaganda leaflet that the Germans have been dropping over our lines lately. The shells carrying them explode with a characteristic feeble plop. The leaflet is printed in minute type on a long strip and folded into a card cover as per illustration. On the ground they look like ordinary "V" book-matches. Page 1 begins with a clock-face registering 3 minutes to 12.

World War No. 2 is almost over!

Nobody can say that as a good soldier you haven't done your duty. But no man in the world will ever blame you for not wishing to be one of the last victims. The trouble about a war is that towards the end the death-rate rises to its highest. Try the safe turn during these last weeks, it is far better for you to be a few weeks ill than all your life dead. You don't know how to do it? Well, we're going to teach you the "rules of the game." But always remember the following:

Troop doctors as a rule are most suspicious in cases where soldiers are simulating. This for the simple reason that the latter are very often exaggerating the symptoms of their pretended illness and that they behave in such a manner which makes it easy to anybody to find out that they want to be ill. Moreover the doctor has the advantage in this game, because he has studied the rules, whereas the average soldier has but a faint knowledge of medicine. The object of this leaflet is to help you in overcoming this difficulty in a proper scientific way, the directions being given in plain language. The following three points are important:



Better a few weeks ill than all your life dead.

1. You must make the impression as if you hated to be ill! The doctor should feel straight away: "Here is a good soldier who has the misfortune of being ill against his will." Therefore you shouldn't exaggerate your illness. A normal sick man is always anxious to get rid of his illness, and he is very glad if the doctor is in a position to tell him that it is nothing serious. Should therefore the doctor tell you that you are still fit for duty, don't say anything, have another go at it and let the others see that "unfortunately you can't." Should the doctor try to comfort you by saying that the troubles you are complaining of are not due to any serious illness, then you should thank him for "having taken the worries off your head." You may come back a few days later with complaints about increased pains, but never come along with a new disease.

2. Make up your mind for one kind of disease and stick to it! If you start complaining of too many different troubles, the doctor will get suspicious. If you strictly follow the directions given for the various kinds of diseases, then the doctor has to mark you as ill. But be careful: if the doctor asks you about symptoms which are not mentioned on your list, don't give yourself away, simply answer: "I haven't noticed anything of the kind."

3. Don't tell the doctor too much! Above all you mustn't tell the doctor the name of the disease you pretend to be suffering from. Don't use any technical terms, doctors don't like that. You will never be found out if you say too little, but you might easily be caught if you say too much.

If you strictly follow the directions contained in the above 3 paragraphs and if you have made yourself thoroughly acquainted with the symptoms of the disease you have picked out, then nothing can go wrong.

Never forget: Better a few weeks ill than all your life dead!

MINOR TROUBLES

ommended to all those who need a few days' rest
not feel fit for a special action which they would
by going to hospital. Even slighter cases of illness can save your life if you manage to get them shortly before you have to leave on a transport or before you go off on a dangerous action.

1. *Inflammation of the foot.*—Soak a ball of cotton of the size of a pea in turpentine and keep it over night between your 3rd and 4th toe. Doing this for a few days will cause an inflammation of the skin. Repeat this experiment with other toes until the inflammation starts spreading. Before reporting to the doctor you must wash your foot very thoroughly with soap, so that the smell of turpentine cannot be noticed. Turpentine may be obtained at any druggist, pharmacist or paint-dealer. In Italian it is called: Terpentina.

2. *Artificial skin inflammation.*—Scratch surface of skin with edge of a piece of glass so that red lines and scratches but no bleeding results. Apply petroleum to scarified skin area until inflammation results. To make condition more serious you may inject a small quantity of petroleum or gasoline under the skin with a thin hypodermic needle. Inject in one or more places, but take a very thin needle so that needle marks don't give you away. If doctor asks you what is responsible for the condition according to your opinion; tell him that you have no idea.

Another way of producing a harmless scarlet-like affection of the skin: Take three times daily, preferably before your meals, one teaspoonful of a 10% solution of iodine potassium in a glass of water. Carry on with this procedure until about five days later a scarlet-like affection of the skin results. This affection of the skin is often accompanied by a cold in the nose. Iodine potassium is a completely harmless medicine and is called in Italian: soluzione di joduro di potassio al 10%. The eczema will disappear within 5 to 8 days, depending on the treatment applied. A few weeks later you might start the game all over again.

3. *Dysentery.*—Take a laxative, preferably castor oil. (In Italian: olio de ricino). When it has begun to work report to your doctor with the following complaints: Tell him that you had a severe attack of dysentery some months ago in Africa, South Italy or some such place, with slime and blood in your motions. Since that time you notice that heavy foods, such as pork and beans, fat meats, &c., produce violent pains in your stomach and diarrhœa. Occasionally your motions have been slimy with red streaks and lumps in them. Tell the doctor that you nearly always suffer from mild gnawing pains in your abdomen high up, especially on the right side, but sometimes also lower down on the left side. Say that you feel weak and run down. When the doctor examines you, show painful response to pressure on the right side immediately below the ribs, also during examination of the right kidney. Stick to your story at the hospital, and don't forget to take a laxative from time to time. A few weeks after leaving hospital you might try the whole thing again.

4. *Slight affection of the stomach.*—Take daily 12 to 15 beans of ricinus. They call them in Italian "fagioli di ricino" and may be obtained at any drug store or pharmacy. Chew the beans well before swallowing. A few days later—time is not the same for everybody—you will feel slight pains in your stomach. Continue eating beans for another two days and then report to your doctor. You merely have to tell the doctor exactly what you feel. If he asks you what could be responsible for the condition, say you might have eaten too much ice-cream or something else that did not agree with you—but you had no idea. The pains, which are accompanied by a slight fever, will disappear as soon as treatment is started.

And don't forget, better a few pains than loss of all sensibility through death.

5. *A harmless inflammation of the eyes.*—If you ride a motor-cycle, if you drive an open car, or if your eyes are often exposed in any other way to a draft, then the following disease is the right thing for you: Take two beans of ricinus and grind them up with a hammer. Introduce a small quantity of the mass so obtained under your upper or lower eyelid with the aid of a match. You may also cut a bean in two, wrap it with a very thin coat of cotton and apply it with the surface obtained by cutting against the edge of your eye. Put a bandage around and leave over night. In the morning remove bandage. The resulting inflammation is altogether harmless but has the great advantage of looking externally very similar to a serious disease of the eyes.

Or try the following: Refrain from cleaning your teeth or rinsing your mouth for a few days. The white substance which then gathers on your teeth will, if introduced under the eyelids, produce the same effect as that described above.

Remember, all people have not got the same constitution, and what may be effective with some people may not produce any effects with others. So if the expected symptoms do not appear within the normal time, carry on with the experiment by gradually increasing the dose, or make up your mind for another disease

TROUBLES OF A MORE SERIOUS NATURE

To be recommended to those who think they need a thorough recovery from the hardships of war in pleasant surroundings with affectionate treatment and good food

1. *Sorethroat*—
Take a silver
tonsils with the
is called "pietra infernale"

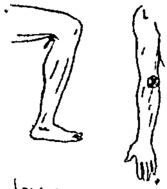
Dissolve a small quantity of yellow mustard or ginger in water. The solution is strong enough when it produces a burning sensation on the tip of your tongue. Mustard is in Italian "senape" and ginger is call zenzero"

Twenty or 30 minutes before you report to the doctor swallow a large pinch of gunpowder Report to the doctor with sore throat Tell him that swall ing has been painful since yesterday and that you do n feel well Simply describe your condition (you will actually feel sick for a short time as a result of the above treatment) Gargle occasionally with mustard or ginger solution to prolong your stay in hospital

The above treatment is absolutely harmless All of the resulting symptoms disappear completely in a few days.

Remember: Better a few weeks ill than all your life dead

2. *Temporary paralysis*—Before going to bed wrap a round stone, eraser, or short piece of rubber tubing in gauze tissue and fasten firmly to exert on spot x (x is the spot where your "funnybone located) with tight bandage and allow to remain over night Take bandage off in the morning Repeat for several days in succession until there is a numb feeling in you forearm and hand The numbness and lack of strength, which remains for only a few minutes after the first treatments, will last for an increasing length of time in the course of further treatment When a sufficient degree of paralysis has resulted report to doctor. Describe
at the ondition which started
worse in the course of time
om time to time to keep up
paralysis but under no circumstances let the doctor find any traces of the bandage. If there are bandage marks on your arm better not report until they are gone, which is usually the case after 24 hours at the latest



Right leg and left arm, indicating nerves

You can produce the same effect on the lower limb with a bandage around the knee

3 *Nervous troubles*—Get hold of Thyroxine tablets. Take 4 times 2 tablets daily When your pulse is more than 100 per minute report to doctor with following complaints You are becoming very nervous lately and feel as though you were "going to pieces" Although appetite has been fair you have lost weight. Sleep has been very poor in the last few weeks You are very irritable and "fly off the handle" at the slightest provocation (to make this more plausible you might provoke a few arguments before going to the doctor).

If after a period of treatment you are returned to the lines you may have a relapse by repeating the above procedure.

Remember Better a few weeks ill than all your life dead

4. *Stomach ulcer*—Report to the doctor with following complaints For a number of months you have been suffering of gnawing and burning pains in the stomach region, which are especially violent 15 to 30 minutes after meals Heavy foods, such as brown bread, beans, cabbage (be sure to mention only foods which you have eaten lately), fatty meals and greasy f

black or very
a condition once, but paid no attention to it, or that you ar
not sure You may also say that you have never noticed anything of the kind, if you wish The doctor will probably send you to hospital for observation

Very important. before you report sick, get hold of a pint of animal blood (cow, ox, hog or sheep) and dry it Don't report to doctor before you have prepared your blood powder (directions below) Take the dried blood to the hospital with you and hide it carefully. At the hospital you will receive a vegetarian diet for a few days for the purpose of testing the blood content of your stools. Take a portion of dried blood powder every evening. The blood test in your stools will be positive and the doctor will mark you as a stomach ulcer suspect Be sure to take portion of blood powder on every day of your stay at the hospital, since the examination may be repeated.

After one or two weeks you may tell the doctor that your complaints are considerably less, if he asks you. If you are dismissed to the front you can have a "relapse" in two or three weeks

Directions for preparing blood powder, pint of animal blood After a few hours it looks like this $\frac{\text{red blood}}{\text{clear serum}}$. Pour serum away and spread red blood cake out on cloth or paper to dry. When perfectly dry pulverize and divide into small portions of about a teaspoonful each and wrap up separately

5. *Jaundice*—Get hold of 30 to 40 digitalis tablets or pills (digitalis is a widely used heart remedy which may be procured from any druggist). In Italy a solution of digitalis 1 · 1000 can be obtained more easily, so if you don't find any tablets or pills take the solution (In Italian: digitalis
tablets = 1 mgm); solution =
sulzione c daily four times 1
tablet or solution dissolved in
water. Carry on the procedure until your pulse rate (taken at rest) has slowed down to 60 or less per minute.

Eat a lot of chocolate Do not clean your teeth or rinse your mouth for a number of days Take 1 gram of picric acid (let the chemist prepare it for you, it is called "acido picrico" in Italian) The skin and the white of your eyes will become yellow. The condition is harmless and disappears completely in a few days Drink 3 raw eggs before going to bed.

Report to the doctor with the following complaints: Your appetite has been bad for a number of days and you do not
feel well Fatty fc o with you
Also, your skin has three days.
You have been suff slight pains
in your abdomen Some time before the onset of your troubles you had diarrhœa, but you didn't pay much attention to the condition, which disappeared in a few days But don't volunteer all this information, let the doctor drag it out of you gradually by his questioning.

SERIOUS DISEASES

To be recommended to all those who are fed up of war and who would rather go back into civil life

1. *Heart disease*—Smoke 20 to 30 cigarettes per day. But if you normally smoke as much, then you might double that number. Get hold of digitalis tablets or pills (digitalis is a drug which is widely used as a remedy for heart disease) and take 4 tablets daily for 1 or 2 weeks Most probably you will find more easily in Italy a solution of digitalis 1 · 1000. In that case you might as well take daily 4 times 10 drops of this solution dissolved in water instead of 4 tablets If after a
drug
You do not feel well and are short of breath after exertions which never caused you any trouble previously. Occasionally you have attacks of pain in the heart region, sometimes with a painful sensation in the left shoulder and arm. Sometimes there is a sharp, stinging pain near the tip of the heart, at other times only an uncomfortable feeling of oppression Violent attacks have occurred 2 or 3 times and have lasted for about 15 minutes; there was cold sweat on your forehead during the attack and you had a feeling as though you were going to die.

The doctor will probably have an electrocardiogram done.

real illness

2. *Tuberculosis*—If you have a smokers' catarrh (and, as a rule, you can easily acquire one by smoking 20 or more cigarettes a day), you can simulate tuberculosis which means that you will be sent back from the lines to a healthful, quiet place in pleasant surroundings with excellent food and a long vacation

Tell the doctor that you have lost some weight lately and that you do not feel well. You cough a great deal, especially in the morning. Recently, you have coughed up tiny clots and streaks of blood in your sputum. Sometimes you wake up in the middle of the night drenched in sweat. You continually feel tired and run down. Stick to these symptoms and don't invent any new ones!

When you are asked to produce some sputum you must mix a very little blood (one or two drops are sufficient) with the sputum. If your gums bleed, you can do that by simply sucking out a bit of blood before producing the sputum, otherwise you must suck the blood from a little wound on one of your fingers.

To make your case convincing you must mix some tuberculosis germs into the sputum. This, of course, is difficult, but every man carries an excellent substitute with him. If you have failed to wash the prepuce (foreskin) of your penis for two or three days a yellow substance called smegma is deposited underneath the foreskin. This substance contains a group of harmless bacteria possessing a very remarkable feature: in appearance and staining qualities (criteria used in routine medical examination to establish the presence of a certain bacterium) they behave exactly like tuberculosis germs. Very few doctors know this, and even if they do they will not have the time or necessary apparatus to make the distinction. Of this smegma you must mix a very small quantity (as much as you can hold underneath your fingernail) with the sputum in your mouth. Produce the mixture of sputum, blood and smegma into the glass or plate which you are given and stick to your story as indicated above.

The doctor will surely have an X-ray made of you. If he finds that it is normal he can only conclude that the tubercular process is situated in some hidden corner which the X ray did not reveal. If you follow the above directions carefully and conscientiously, there is no danger of your being found out.

Remember: Better a few weeks ill than all your life dead.

AN ADVICE: Some of the drugs mentioned in the above directions can only be obtained against a doctor's prescription. If you can't get hold of a prescription, then consider the following:

1. *The Italians are cowards*: Rush into a pharmacy and say you must have the medicine at once for your troop doctor who is in urgent need of it. Be determined and resolute in your demand. If you see the chemist is hesitating, take out your pistol and put it on the table without saying a word. You will find that in most instances this proves very effective.

2. *The Italians are corruptible*: If you think you can't be determined and resolute enough, try it with money. In Italy anything may be obtained for money.

IMPORTANT!

All the above directions are based on scientific observations and experiments in well-known university hospitals. They do not produce any illness, but mere symptoms which cannot be distinguished from real diseases, even by trained troop doctors.

They are absolutely harmless! We wouldn't be so silly to make you lose confidence in our directions by giving you dangerous prescriptions.

Never forget: Better a few weeks ill than all your life dead.

The authors would be disappointed if they could see how lightly their elaborate propaganda is received by our soldiers. They say they know far better tricks than these! Most of the suggestions are impracticable here. It is curious that the psychiatric side is so lightly dismissed.

Is it a coincidence, do you think, that the recurring refrain about "Better a few weeks ill . . ." is a near quotation from the Irish song, *Slattery's Mounted Fut*, which says: "Better be a coward five minutes than a dead man all your life"?

* * *

I have a reputation for trying new drugs as they appear. The morning sister was off duty: the confident young staff-nurse (married to an officer recently wounded in Holland) tackled me about the pills I had ordered for the patient who was proving obstinately costive. She was frankly puzzled. "What is this new aperient you've ordered?" she asked. "I wrote it down and asked some of my friends but none of them had heard of it. [illegible] didn't know what it was." Shades of the la[illegible] ordered a couple of No. 9's.

Parliament

CONTRIBUTORY NEGLIGENCE BILL

IN the House of Commons on Feb. 22 Sir D. MAXWEL FYFE, Solicitor-General, moved the second reading o the Law Reform (Contributory Negligence) Bill, whic has already passed through the House of Lords. H explained that whereas on land a person who had con tributed to causing an accident by his negligence faile utterly; at sea a ship in the same position got the prope proportion of the damage. Generally the intention c the present Bill was to apply the Admiralty rule t accidents on land, and thus give the injured plainti the right to a proportion of the damages that he or sh would have recovered had he or she been entirely fre from blame. The Bill would not apply to action brought by a workman against his employer for acciden occurring in the course of and arising out of his employ ment, but this was a temporary provision pending th further consideration of alternative remedies.

In the debate Dr. RUSSELL THOMAS suggested tha the Bill might tend to increase the number of actio taken wilfully against professional men on the off-chanc of getting a quantum of damages. He had investigate a long list of such actions taken over the last 30 or 4 years against doctors, and he found that in few cas did the plaintiff succeed, and the court often condemne the plaintiff for bringing the action. Many of the actio were due to distress of mind, but sometimes to spi or malice or sense of grievance. Cases against docto often fell into the category of actions resulting fro confinements, pecuniary loss due to compulsory notific tion of infectious disease, and the treatment of fracture It would be easy, perhaps, now to come to court an endeavour to show some degree of negligence.

Sir D. MAXWELL FYFE said he had had experience i the class of actions referred to by Dr. Russell Thoma but the question of contributory negligence aro seldom, and the issue in these cases was whether the had been negligence or some breach of duty on the pa of the professional man. That took a great deal establishing, and there were few successful cases. I that class of case he could not see that the profession defendant would be prejudiced in any way.

FROM THE PRESS GALLERY

The National Loaf

IN the House of Lords on Feb. 28 Lord TEVIOT aske whether the extraction rate of wheat used in the nation flour had been reduced below the 85% standard of 194 and moved that this should be regarded as the minimu compatible with health, and that if the extraction ra had been reduced it should be restored to the 194 figure forthwith. He recalled that before the war t extraction rate was 70–72%; in March, 1942, it stoo at 75%, and was then raised to 85%; it was now 80 or lower.

I want to know definitely, Lord Teviot continue why this reduction has taken place and on whose advi it has been made. For instance, has the Ministry Health, the Special Diets Committee of the Medic Research Council, or the scientific advisory committ on food policy, set up by the Ministry of Health in 194 been consulted? I am informed that this last com mittee has not met for two years. It has been foun that wholemeal or high-extraction flours are of high nutritive value when tested on experimental anima than 70% extraction flour, even when this is fortifie to the greatest possible extent by the addition of foo factors removed in the milling of white flour. There a eleven factors in this matter and it has only been fou possible to manufacture enough of three of them fortify the white loaf. That leaves eight factors great importance. In my view and the view of tho with whom I have discussed this matter it is ridiculo to claim that the addition of the three factors to whi flour will make it as nutritious as 85% extraction flou It is highly improbable that we shall ever be able manufacture the factors removed by milling white flo in quantities and in forms identical with those in t natural wheat. Therefore, why remove them? Tes carried out by the Medical Research Council showed th the maximum nutritive value of wheat with the minimum of bran was secured by milling 85% extraction. Why then was this extraction rate lowered? The medical profession and nutrition experts throughout the country are unanimous in deploring the change. We hear that people prefer white bread, but I wonder whether that statement has been really tested. I have often asked people what bread they eat and the answer invariably is, "I try to get

The Minister

flour content

75%. What is in the other 25%? The people of our country should know what they are eating.

Lord **ADDISON** asked what were the commercial considerations involved. As Minister of Agriculture he had gathered from conferences with those in the industry that if you took a bigger proportion of "offals" out of the wheat what remained had a greater proportion of starch, and you might be able to sell the "offals"—they were not offals in the colloquial sense—very profitably. It therefore pays, he said, to increase the percentage of offals taken out. Moreover, he went on, white bread contains more starch than wholemeal bread, and this is profitable because a starchy bread will absorb more water. In former days 92–96 quartern loaves could be produced per standard sack of flour, but with modern milling methods, operating on a very white flour, the number could be raised to 102, which meant an additional 32 lb. What of? Water.

LORD HORDER'S VIEWS

Lord **HORDER** recalled that the main consideration in raising the extraction rate of flour during the war was not primarily the health of the nation but the urgent demand for shipping space. In this way 500,000–600,000 tons of shipping space were saved per annum. ord Woolton did also appreciate that he was on the de of the angels in the matter of national health. here was a good deal of opposition to the 85% extracon in the early days, but it is now a good many months nce any complaint has come to the Ministry, though ere are a few individuals who say the national wheateal bread does not agree with them. But experience d borne out Lord Horder's forecast that no single ep the Government could have taken in regard to e nation's food was so calculated as this to raise the untry's nutrition. As an example, it has made the untry much less constipated. People have broken eir bad habit of eating white bread; are we going w to ask them to unlearn their lesson? The Prime inister warned us that we are now more hard-pressed r shipping than ever before; our milk-supply is mentably deficient; and about a quarter of our tire crop of potatoes has been lost by frost, &c. The habitants of several of the liberated, or about to be erated, countries are starving, and the rise in the traction rate from 75% to 85% supplied enough extra ead to give 1¼ million people a pound a day. In view all these circumstances is it to be wondered at that ople ask the reason for the Government's decision. hey are not impressed by being told that as the war is, e hope, nearly over, people will say: "This is a free untry; let us have the bread we like." Are we ing to compel the citizen who has learnt the value of nutritious loaf, which he now prefers, to return to e pre-war bread from which he has been weaned, if is is a free country? And as for clamour, there is no owd in Downing Street shouting, "We will have hite bread;" there is not even a Press campaign. was assumed, rather prematurely, that if we had no fals for the cows we should have a shortage of milk, t there is no evidence that milling offals are good milk oducers, and we have it on the authority of Professor ay, of the National Institute for Research in Dairying, at the vitamins of wheat offals are wasted on the cows. deed, Professor Kay alleged that the cow would not ve a whisk of her tail if she never saw wheat offals ain. As for pigs and chickens, the addition of wheat fals to their food does help them considerably to thrive. he people who are so anxious to give the germ of the heat which we want in our bread to pigs and chickens should give the pigs and the chickens the vitamins that they want to put back into our bread; man should be reserved to the end if we want to experiment. The one consideration which might justify, at some future time but not yet, a reduction in the extraction rate is the knowledge which recent researches have given us of the intimate composition of the wheat berry. For these researches great credit is to be given to Dr. Moran and his colleagues at the Cereals Research Station at St. Albans. The Government have "cashed-in" already on these researches, and done so somewhat hastily many people think. It has been officially stated that as a result of the first lowering of the extraction rate by 2½% last October, the sacrifice of essential nutrients of the vitamin class was inappreciable, but we do not know yet what we have lost by the second 2½% reduction on Jan. 1. You cannot go on using the word "inappreciable" with every 2½% reduction indefinitely, because you are bound to come to a point where some thinking person will ask you "How many 'inappreciables' go to an 'appreciable'?"

I strongly favour our sticking to the natural food, said Lord Horder, especially when that food is our staple article of diet, as against adopting a food which has been modified rather on the lines of an economical equation. The Red Army is *fed on 100% extraction*—it takes no risks in this matter—and judging by its performance it is justified. At best we can replace only the nutrients that we know and can estimate; we cannot replace those which, though known to nature when she makes the wheat berry, are unknown to the chemist. When Hopkins made his *pioneer discoveries* in the field of vitamins forty years ago he spoke of "countless substances" which would eventually be found to come into this category. We are still in the early days of this science of nutrition. Every year we add to our knowledge and surely the moral is not to tinker with so important an article of food as bread until our knowledge is much more advanced than it is today. It is between these very figures of 85 and 75% that any lowering of the extraction rate loses to us the wheat germ which contains the constituents that we require most. An 80% extraction rate may be justified in the light of our increased knowledge as applied to milling technique, but I do plead with the Government not to make the extraction rate lower than this. The Government should effect a specification of the loaf as a long-term post-war policy. The specification obviously will be changed from time to time, but let us have a post-war specification based

Lord **GEDDES** said

an important bearing

as well as upon gene

knowledge anywhere in the world today which would enable us to take pure starch and put in all the things that are required to make that pure starch a complete and adequate diet. *That* is a part of what is being tried to be done when you add to a flour something that you think you have extracted. You cannot know whether you are putting back the whole *thing that* has come out. It pays a miller to have people eating brown bread on a basis of profit per loaf. But it pays the miller better over the whole of his business *to have* people eating white bread, because they have to eat so much more white bread to get the feeling of nutrition that they get from eating *brown bread*. I can see why the millers would be satisfied with a low extraction, but I am certain they would never oppose a higher extraction.

Viscount **BLEDISLOE**, who at one time had the third largest herd of pigs in " milling
offals, particularly sh ran, are
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pigs are concerned, because there are factors in these offals which build up the *framework* of the young animal and for which there is no adequate substitute. But surely children must be given a priority over pigs.

GOVERNMENT EXPLANATION

Lord **WOOLTON** explained that before the Government decided to reduce the rate *of extraction* they consulted the Minister of Health and his chief medical adviser, the Scientific adviser of the Ministry of Food, and the secretary of the Medical Research Council. The Scientific
A never been consulted on a
n nor was the Special Diets
C search Council brought into

Tell the doctor that you have lost some weight lately and that you do not feel well. You cough a great deal, especially in the morning. Recently, you have coughed up tiny clots and streaks of blood in your sputum. Sometimes you wake up in the middle of the night drenched in sweat. You continually feel tired and run down. Stick to these symptoms and don't invent any new ones!

When you are asked to produce some sputum you must mix a very little blood (one or two drops are sufficient) with the sputum. If your gums bleed, you can do that by simply sucking out a bit of blood before producing the sputum, otherwise you must suck the blood from a little wound on one of your fingers.

To make your case convincing you must mix some tuberculosis germs into the sputum. This, of course, is difficult, but every man carries an excellent substitute with him. If you have failed to wash the prepuce (foreskin) of your penis for two or three days a yellow substance called smegma is deposited underneath the foreskin. This substance contains a group of harmless bacteria possessing a very remarkable feature: in appearance and staining qualities (criteria used in routine medical examination to establish the presence of a certain bacterium) they behave exactly like tuberculosis germs. Very few doctors know this, and even if they do they will not have the time or necessary apparatus to make the distinction. Of this smegma you must mix a very small quantity (as much as you can hold underneath your fingernail) with the sputum in your mouth. Produce the mixture of sputum, blood and smegma into the glass or plate which you are given and stick to your story as indicated above.

The doctor will surely have an X-ray made of you. If he finds that it is normal he can only conclude that the tubercular process is situated in some hidden corner which the X ray did not reveal. If you follow the above directions carefully and conscientiously, there is no danger of your being found out.

Remember: Better a few weeks ill than all your life dead.

AN ADVICE: Some of the drugs mentioned in the above directions can only be obtained against a doctor's prescription. If you can't get hold of a prescription, then consider the following:

1. *The Italians are cowards*: Rush into a pharmacy and say you must have the medicine at once for your troop doctor who is in urgent need of it. Be determined and resolute in your demand. If you see the chemist is hesitating, take out your pistol and put it on the table without saying a word. You will find that in most instances this proves very effective.

2. *The Italians are corruptible*: If you think you can't be determined and resolute enough, try it with money. In Italy anything may be obtained for money.

IMPORTANT!

All the above directions are based on scientific observations and experiments in well-known university hospitals. They do not produce any illness, but mere symptoms which cannot be distinguished from real diseases, even by trained troop doctors.

They are absolutely harmless! We wouldn't be so silly to make you lose confidence in our directions by giving you dangerous prescriptions.

Never forget: Better a few weeks ill than all your life dead.

The authors would be disappointed if they could see how lightly their elaborate propaganda is received by our soldiers. They say they know far better tricks than these! Most of the suggestions are impracticable here. It is curious that the psychiatric side is so lightly dismissed.

Is it a coincidence, do you think, that the recurring refrain about "Better a few weeks ill . . ." is a near quotation from the Irish song, *Slattery's Mounted Fut*, which says: "Better be a coward five minutes than a dead man all your life"?

* * *

I have a reputation for trying new drugs as they appear. The morning sister was off duty: the confident young staff-nurse (married to an officer recently wounded in Holland) tackled me about the pills I had ordered for the patient who was proving obstinately costive. She was frankly puzzled. "What is this new aperient you've ordered?" she asked. "I wrote it down and asked some of my friends but none of them had heard of it. Sister didn't know what it was." Shades of the last war! I'd ordered a couple of No. 9's.

Parliament

CONTRIBUTORY NEGLIGENCE BILL

IN the House of Commons on Feb. 22 Sir D. MAXWELL FYFE, Solicitor-General, moved the second reading of the Law Reform (Contributory Negligence) Bill, which has already passed through the House of Lords. He explained that whereas on land a person who had contributed to causing an accident by his negligence failed utterly, at sea a ship in the same position got the prope proportion of the damage. Generally the intention o the present Bill was to apply the Admiralty rule t accidents on land, and thus give the injured plaintif the right to a proportion of the damages that he or sh would have recovered had he or she been entirely fre from blame. The Bill would not apply to action brought by a workman against his employer for accident occurring in the course of and arising out of his employ ment, but this was a temporary provision pending th further consideration of alternative remedies.

In the debate Dr. RUSSELL THOMAS suggested tha the Bill might tend to increase the number of action taken wilfully against professional men on the off-chanc of getting a quantum of damages. He had investigate a long list of such actions taken over the last 30 or 4 years against doctors, and he found that in few case did the plaintiff succeed, and the court often condemne the plaintiff for bringing the action. Many of the action were due to distress of mind, but sometimes to spit or malice or sense of grievance. Cases against docto often fell into the category of actions resulting fro confinements, pecuniary loss due to compulsory notifica tion of infectious disease, and the treatment of fracture It would be easy, perhaps, now to come to court an endeavour to show some degree of negligence.

Sir D. MAXWELL FYFE said he had had experience i the class of actions referred to by Dr. Russell Thoma but the question of contributory negligence aro seldom, and the issue in these cases was whether the had been negligence or some breach of duty on the pa of the professional man. That took a great deal establishing, and there were few successful cases. I that class of case he could not see that the profession defendant would be prejudiced in any way.

FROM THE PRESS GALLERY

The National Loaf

IN the House of Lords on Feb. 28 Lord TEVIOT aske whether the extraction rate of wheat used in the nation flour had been reduced below the 85% standard of 194 and moved that this should be regarded as the minimu compatible with health, and that if the extraction rate had been reduced it should be restored to the 1942 figure forthwith. He recalled that before the war the extraction rate was 70–72%; in March, 1942, it stood at 75%, and was then raised to 85%; it was now 80% or lower.

I want to know definitely, Lord Teviot continued, why this reduction has taken place and on whose advice it has been made. For instance, has the Ministry of Health, the Special Diets Committee of the Medical Research Council, or the scientific advisory committee on food policy, set up by the Ministry of Health in 1940, been consulted? I am informed that this last committee has not met for two years. It has been found that wholemeal or high-extraction flours are of higher nutritive value when tested on experimental animals than 70% extraction flour, even when this is fortified to the greatest possible extent by the addition of food factors removed in the milling of white flour. There are eleven factors in this matter and it has only been found possible to manufacture enough of three of them to fortify the white loaf. That leaves eight factors of great importance. In my view and the view of those with whom I have discussed this matter it is ridiculous to claim that the addition of the three factors to white flour will make it as nutritious as 85% extraction flour. It is highly improbable that we shall ever be able to manufacture the factors removed by milling white flour in quantities and in forms identical with those in the natural wheat. Therefore, why remove them? Tests carried out by the Medical Research Council showed that

the maximum nutritive value of wheat with the minimum of bran was secured by milling 85% extraction. Why then was this extraction rate lowered? The medical profession and nutrition experts throughout the country are unanimous in deploring the change. We hear that people prefer white bread, but I wonder whether that statement has been really tested. I have often asked
he answer invariably is,
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flour content of the national loaf was approximately 75%. What is in the other 25%? The people of our country *should know what they are eating.*

Lord **Addison** asked what were the commercial *considerations involved.* As Minister of Agriculture he had gathered from conferences with those in the industry that if you took a bigger proportion of "offals" out of the wheat what remained had a greater proportion of starch, and you might be able to sell the "offals"—they were not offals in the colloquial sense—very profitably. It therefore pays, he said, to increase the percentage of offals taken out. Moreover, he went on, white bread contains more starch than wholemeal bread, and this is profitable because a starchy bread will absorb more water. In former days 92–96 quartern loaves could be produced per standard sack of flour, but with modern milling methods, operating on a very white flour, the number could be raised to 102, which meant an additional 32 lb. What of? Water.

LORD HORDER'S VIEWS

Lord **Horder** recalled that the main consideration in raising the extraction rate of flour during the war was not primarily the health of the nation but the urgent demand for shipping space. In this way 500,000–600,000 tons of shipping space were saved per annum. Lord Woolton did also appreciate that he was on the side of the angels in the matter of national health. There was a good deal of opposition to the 85% extraction in the early days, but it is now a good many months since any complaint has come to the Ministry, though there are a few individuals who say the national wheatmeal bread does not agree with them. But experience had borne out Lord Horder's forecast that no single step the Government could have taken in regard to the nation's food was so calculated as this to raise the country's nutrition. As an example, it has made the country much less constipated. People have broken their bad habit of eating white bread; are we going now to ask them to unlearn their lesson? The Prime Minister warned us that we are now more hard-pressed for shipping than ever before: our milk-supply is lamentably deficient; and about a quarter of our entire crop of potatoes has been lost by frost, &c. The inhabitants of several of the liberated, or about to be liberated, countries are starving, and the rise in the extraction rate from 75% to 85% supplied enough extra bread to give 1¼ million people a pound a day. In view of all these circumstances is it to be wondered at that people ask the reason for the Government's decision. They are not impressed by being told that as the war is, we hope, nearly over, people will say: "This is a free country; let us have the bread we like." Are we going to compel the citizen who has learnt the value of a nutritious loaf, which he now prefers, to return to the pre-war bread from which he has been weaned, if this is a free country? And as for clamour, there is no crowd in Downing Street shouting, "We will have white bread;" there is not even a Press campaign. It was assumed, rather prematurely, that if we had no offals for the cows we should have a shortage of milk, but there is no evidence that milling offals are good milk producers, and we have it on the authority of Professor Kay, of the National Institute for Research in Dairying, that the vitamins of wheat offals are wasted on the cows. Indeed, Professor Kay alleged that the cow would not give a whisk of her tail if she never saw wheat offals again. As for pigs and chickens, the addition of wheat offals to their food does help them considerably to thrive. The people who are so anxious to give the germ of the wheat which we want in our bread to pigs and chickens should give the pigs and the chickens the vitamins that they want to put back into our bread; man should be reserved to the end if we want to experiment. The one consideration which might justify, at some future time but not yet, a reduction in the extraction rate is the knowledge which recent researches have given us of the intimate composition of the wheat berry. For these researches great credit is to be given to Dr. Moran and his colleagues at the Cereals Research Station at St. Albans. The Government have "cashed-in" already on these researches, and done so somewhat hastily many people think. It has been officially stated that as a result of the first lowering of the extraction rate by 2½% last October, the sacrifice of essential nutrients of the vitamin class was inappreciable, but we do not know yet what we have lost by the second 2½% reduction on Jan. 1. You cannot go on using the word "inappreciable" with every 2½% reduction indefinitely, because you are bound to come to a point where some thinking person will ask you "How many 'inappreciables' go *to an 'appreciable'?"*

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pigs are concerned, because there are factors in these offals which build up the framework of the young animal and *for which* there is no adequate substitute. But surely children must be given a priority over pigs.

GOVERNMENT EXPLANATION

Lord **Woolton** explained that before the Government decided to reduce the rate of extraction they consulted the Minister of Health and his chief medical adviser, the scientific *adviser of the Ministry* of Food, and the secretary of the Medical Research Council. The Scientific Advisory Committee have never been consulted on a matter of this character, nor was the Special Diets Committee of the Medical Research Council brought into consultation, for its job is to advise the Minister of Food on the food requirements of persons suffering from specific diseases. The millers were not consulted. He would not say what advice was given by the various persons consulted. Where, he asked, are we going to arrive if Ministers who are responsible to Parliament are to say what was the opinion of this or that adviser? This decision was made on his own advice, before he left the Ministry of Food. His decision followed a visit to the Ministry of Food research station at St. Albans, where Sir Jack Drummond and Dr. Moran told him of their work which showed that the bulk of the vitamins and minerals in the wheat grain are located in the germ, particularly the scutellum fraction, and in the outer endosperm adjoining the bran. It was found possible to separate the scutellum and bring it into the flour, and in this way to make an 82% extraction flour which contained as much vitamin B as the previous 85% extraction[1] while containing less bran. Of the other vitamins some were increased and some decreased. Since then, Lord Woolton continued, it has been suggested that we can go lower and still get all the advantages from a health point of view with less bran. We are trying that experiment out. We do not intend to reduce the rate below 80% until we are satisfied that it will not be detrimental from a nutritional point of view.

Lord BALFOUR OF BURLEIGH enquired on what authority the further reduction in rate of extraction to 80% was made. The results of the analysis of that extraction have not yet been published, and are not yet satisfactorily established. Many of us fear that in the reduction from 82½% to 80% the flour has lost, among other things, an undue proportion of iron. There is evidence of a general reduction in anæmia during the war, and it seems probable that the national bread, which has increased the intake of iron, is responsible. One of the greatest authorities on nutrition in the country guesses that the 80% extracted flour contains 40% less iron than the 85% flour; he expects an increase in anæmia as a result of the reduction, and if the rate of extraction is further reduced to 70–72% he expects a great increase. Do let us make sure what the result of 80% extraction is before we put it down or up.

Pressed for a firm undertaking that the extraction rate would not be reduced below 80%, Lord WOOLTON said he could not be absolutely precise, because a varying proportion of imported flour of lower extraction is now mixed with the national flour. With this proviso he repeated this assurance:

> "We do not intend to reduce the extraction rate below 80% until we are satisfied that it will not be detrimental from the nutritional point of view."

Mr. E. J. SMITH

Mr. E J Smith, custodian of the Buckston Browne Farm of the Royal College of Surgeons at Downe, has died at the age of 55. He entered the service of the College as messenger in 1908, being promoted museum attendant in 1913. He thus had as colleague the celebrated prosector, William Pearson, whose tradition of skill and devoted service he absorbed and maintained He served in France with the County of London Regiment during the 1914–18 war, and on his return was placed in charge of room 1 of the museum, where the anatomical and osteological collections and the unique series of ancient and modern human crania were his special care. A patient, industrious, and careful worker, he became a master of skull-craft and an accomplished osteological draughtsman. He was unsurpassed, and probably unequalled, in the technique of restoring fragmentary crania, and it was he who chiselled out of their rock matrix the fragile fossil bones of the Mount Carmel child. Geologists and archæologists brought to the museum for identification fossil or ancient bones and Smith traced these (often minute) fragments with an acumen born of familiarity with the College collections When the Buckston Browne Farm was opened in 1932 Smith was appointed custodian, and Mrs Smith housekeeper. Although born and bred a Londoner, he took kindly to village life. His modesty and quiet intelligence earned the respect of all, and he continued to serve the College with characteristic fidelity and conscientiousness

Letters to the Editor

OUR TUBERCULOSIS SERVICE

SIR,—I was extremely interested in your leading article last week and would like to say how wholeheartedly I agree with your statements about the unevenness of the standards of treatment, the need fo amalgamation of the smaller local-government authorities, and the absence of any adequate scheme for the rehabilitation of patients once they have left a sanatorium. I should, however, like to bring to your notice one or two suggestions which would in my opinion be an improvement on the present system.

Open pulmonary tuberculosis must, it is generally recognised, be isolated: but it is only one of the diseases which affect the lungs, albeit a most important one, and at the level of primary diagnosis at all events it would I think be better if this work was carried out by a team of doctors who have special knowledge of diseases of the chest of all types rather than by those specialising in only one branch of the subject.

Primary diagnosis should be nowhere better done than at a special outpatient clinic of a general hospital. (Whether the hospital is voluntary or municipal is of secondary importance provided that it is efficient and centrally placed.) The patients could there be divided into three classes. Those who were proved cases of pulmonary tuberculosis should be segregated and treated in a sanatorium, which could be a geographical part of a general hospital or could be a separate unit many miles away, depending on local conditions. Those of doubtful diagnosis should undoubtedly remain at the general hospital under close observation until the doubt was resolved: and those suffering from non-tuberculosis conditions should be treated in accordance with their needs either in the general hospital or at home. At the Brompton Hospital for Diseases of the Chest this type of organisation has been working with eminent success for many years; and one visualises such a department at each of the key hospitals throughout the country. Further one would hope to see the closest cooperation between the chest departments and the already existing local-authority sanatoria.

In charge of the department there would be a physician with an adequate staff of assistants; in order to attain the proper unity in the whole thoracic service this physician should act in a consulting capacity to the attached sanatoria, and it should be possible to call him in to help in any difficult chest problems wherever they occurred in the areas served by the hospitals. He would have to be a man primarily of outstanding clinical ability.

The surgical side of such an organisation has already been partly determined. Since the outbreak of the present war thoracic units have been established up and down the country, associated with university medical centres under the Emergency Medical Service. These units have come to stay. They have done excellent work not only in treating chest cases but also in opening the eyes of the medical profession to the advances which surgery has made in the treatment of chest injuries and diseases. In a future thoracic service these units should work with the chest departments previously outlined. It will probably be unnecessary to have a thoracic surgeon attached to each; but with a very little arrangement it should be possible for a visiting surgical team to deal with the cases in each centre, with a resident surgical officer of registrar status to watch the day-to-day progress of the cases in the absence of the senior surgeon. The thoracic surgeon should be responsible for all major chest surgery in his region.

Tuberculosis outpatient clinics, including artificial pneumothorax therapy, should ideally be held in the general hospital where they would have the assistance of radiological, pathological and other departments of the hospital when needed. They would be run by the tuberculosis officer but should nevertheless be the responsibility of the physician in charge of the chest department.

Attached to the [illegible] clinic of the future one ca [illegible] plant with its team of specialists; and by this means it is reasonable to hope that many chest diseases will be detected at a time when there is a good chance of cure, avoiding the present, too-frequent disappointments of advanced phthisis and inoperable carcinoma when the patient is first seen.

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[1] See *Nature, Lond.* 1944, 154, 788.

Exeter. C. J. FULLER.

PNEUMOCOCCAL LOBAR PNEUMONIA

SIR,—May I reply briefly to the comments by Dr. Ramsay and Dr. Luxton (Feb. 24) on my paper of Feb. 3 and my letter of the following week?

The benefits of chemotherapy in lobar pneumonia have been very difficult to assess, but the analysis of 1940 cases by Anderson[1] and his colleagues in Glasgow confirmed [illegible] mortality-rate [illegible] bacteræmia, [illegible] the duration [illegible] aring this in mind Dr. Ramsay and Dr. Luxton would surely agree that the 17 cases with very low blood-levels which I [illegible] ill patients. Although [illegible] and I was aware of the [illegible] hemotherapy was with- [illegible] highly improbable that [illegible] overed without chemo- herapy.

There may be effective ranges of the blood-concentra- on of the sulphonamide drugs; but the evidence is not onclusive, and it is my firm belief that there is no need exceed the recognised dosage of sulphonamide. nlike Dr. Ramsay, I feel that, for patients who are itically ill or who do not respond satisfactorily, more tensive chemotherapy is not the most important means reducing the fatality-rate in pneumonia.

We cannot influence the incidence of pneumonia in e aged, but we can begin chemotherapy earlier in the lness. Dr. Ramsay in his paper of Jan. 20 does not ention this as a means of reducing the fatality-rate. ospital cases represent a small proportion of all cases pneumonia. General practitioners are unable to etermine the blood-level of the sulphonamide; but ith early diagnosis sulphonamide treatment can be arted, either at home or preferably in hospital, at a ery early stage of the illness.

ARCHIBALD DICK.

TRAUMATIC ANURIA

SIR,—Apart from the question whether in anuria the rst or second convoluted tubules of the kidney are the ore affected, there is a deeper issue. In the case of the iner crushed by falling rock, reported in your issue of eb. 3, one reads that in spite of the oliguria and anuria rge quantities of fluid by mouth and intravenously ere given. From the time of admission nine pints ere administered on the first day: with an output of oz. of black and smoky urine. The next day, eleven ints were given; but there was no urine at all. On the d day eleven pints produced only 5 oz. of black and moky urine. Three pints, all by mouth, on the 4th day ave ½ oz. of clear urine; and five pints the next day ave 7 oz. of clear urine. But on the 6th day five pints y mouth gave no urine; and the patient died on the lay after. Post mortem, "the kidneys were enlarged nd swollen and the capsule thin and tense." The edulla of the kidney was "engorged, with very clear ifferentiation between cortex and medulla."

This postmortem finding is not unique: it is common all cases of anuria, whether occurring in cases of testinal obstruction, in cases of urinary difficulty from nlarged prostate, after the strains of labour (especially n women with the so-called toxæmia of pregnancy), nd doubtless in many other cases—even in soldiers wounded by high-explosive missiles. (See cases of "traumatic uræmia" reported by Darmady and others in THE LANCET of Dec. 23 last.) It is not only common to these cases: it is a conspicuous feature in patients dying of acute Bright's disease. In view of the facts [illegible] ot get out of the (1) th [illegible] ts the corte [illegible] stion. flow [illegible] rts of this engorgement of the medulla [illegible] the medulla), receive consideration? But in your leader of Feb. 24 this state of the medulla is not referred to: clinicians at the bedside give it no regard: pathologists pass it over without comment. It is clear that to understand anuria, the cause or causes of congestion of the renal medulla must be elucidated.

In a letter one cannot go deeply into this question: but I may perhaps say that the condition must be due either to factors preceding admission or/and to what happens after. Exposure (the effect of cold), the psychic reaction (the effect of fear), the pain and its possible reaction—these do not occur without causing changes in the circulation. Vomiting seems an especial cause in certain cases (see reports of Darmady et al.). Treatment, however, is of some effect. This last week, in a film called *Accident Service* shown at the Royal Society of Medicine, I saw on the screen a patient, stated to be suffering from shock, treated in the horizontal posture. The first thing to do in shock, in my view, is to place the patient in the Trendelenburg position: that, in itself will keep him alive. The pressing of fluids seems to me bad. In acute Bright's disease clinicians have learnt to limit fluids. Possibly the time may come when, faced with anuria, clinicians will dictate an even more stringent treatment. One pint of fluid a day, rather than the pressing of fluids; venesection rather than transfusion; heat to the body generally rather than ice-packs to the affected limb or limbs or parts; the Trendelenburg position rather than the horizontal and the lateral; the semiprone (Sims's position) rather than the dorsal—all these come up for consideration.

What one wants to do is to prevent the condition or to save the patient when it has developed. Whether the first or second convoluted tubules are the more affected can be neglected: however it be, resolution of this question helps neither in prophylaxis nor in treatment.

Rugby. R. H. PARAMORE.

POLIOMYELITIS

SIR,—In [illegible] otation on "What determine [illegible] ?" (Feb. 17) you make the [illegible] d remarks:

> "May not the minor illnesses associated with poliomyelitis epidemics be, after all, not abortive cases of the disease, but rather instances of an associated infection which, in the unlucky, opens the way to an attack by the virus? . . . We are accustomed to the idea that virus infections pave the way for secondary bacterial invaders. The notion that bacteria may pave the way for viruses is not new . . . and we may yet learn that there is a rheumatic-fever virus activated by streptococci."

I merely write to point out that this last suggestion has recently been put forward with a certain amount of supporting evidence (*Ann. rheum. Dis.* Sept. 1944) that this may in fact be found to be the basic rôle of the streptococcal infections in the ætiology of rheumatic fever.

BLA W. S. C. COPEMAN.

TREATMENT OF BURNS

SIR,—Your annotation of Feb. 3 quotes a statement by Mr. Thomas Gibson and Dr. Alexander Brown of the Glasgow burns unit, that adults with burns of more than 15% of the body surface, and children with burns of more than 5–10%, need transfusion of plasma, &c. The area of *one* side of the casualty's hand may approximately be considered as 1% of his total surface area. Surely a casualty with a burn of considerably less than 15 of his hand areas in the case of an adult, and 5–10 of his hand areas in the case of [illegible] it? In an article by M. C. [illegible] February, 1941), a "minor" [illegible] which, among other factors, not more than one-tenth (i.e., ten hand areas) of the body surface is involved. This appears excessive. I should be inclined to consider [illegible] % (i.e., the area approxim- [illegible] hand) as approaching the [illegible] y of course if involving face, trunk, hands, or flexures, and if of second-degree or worse intensity. I should add that Oldfield later classifies "nearly all burns in babies and small children" as major.

Guildford, Surrey. J. L. BARFORD.

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1. Anderson, T., Aitchison, J. D., Alstad, K. S., Barclay, R. S., Dick, A., McKenzie, D., Markson, J. L. Pneumococcal Pneumonia and its Treatment in Glasgow, 1938–42. Published by the authority of the Committee on Health, Glasgow.

RESTAURANT HYGIENE

SIR,—Mr. Linfoot's letter in your issue of Feb. 24 describes some interesting bacteriological findings, and everyone will agree on the importance of cleanliness in restaurants. But the inference which he attempts to draw from his findings can hardly be correct. There is little reliable evidence that disease is spread by drinking from cracked cups, although there is a considerable amount of evidence that carelessness in the preparation of food, particularly neglect in washing hands, can cause outbreaks of infectious disease. It is probable, too, that any pathogenic organism found in the crack of a cup would be present in too small numbers to infect a person drinking from the cup.

Mr. Linfoot's argument is an example of the wrong use of bacteriological investigations, which should be used to confirm clinical findings or suspicions and not as a means of propounding a definite theory of a disease. We live in a world teeming with bacteria of all sorts, and the mere isolation of a micro-organism from any particular place does not necessarily mean that it is a source of disease.

London, SW. AMULREE.

ARTIFICIAL RESPIRATION

SIR,—Whether the method of artificial respiration by rib traction, as described by Dr. Viswanathan on Feb. 24, is as time-honoured as those of Schafer and Silvester, I know not; but it is certainly not new. In 1907, whilst I was a postgraduate student in the University Women's Hospital in Berlin, the method, to me then a novelty, seemed to be in common use. That is where I learnt it, and on the few occasions on which I have had to do artificial respiration for respiratory failure in cases of general anæsthesia or eclampsia, I have used none other and have taught it to house-surgeons and students. It is simple and easy, but one must work gently, though firmly. As for its efficacy and superiority over Silvester's, I am in complete agreement with Dr. Viswanathan, who has done a good service in proclaiming it so excellently.

London, W1. EARDLEY HOLLAND.

CONTROL OF LIVER EXTRACTS

SIR,—Your leader last week refers to "the more highly purified types of liver extract, such as those composed largely of the Dakin and West fraction." We have prepared (*Brit. med. J.*, 1945, i, 75) a fraction at least ten times as pure as Dakin and West's fraction (*J. biol. Chem.*, 1935, **109**, 489), as judged by comparison of the hæmatological data recorded. The method of preparation bears no resemblance to the method described by these authors.

We are aware that our fraction is not a pure substance, and write to correct a common impression that the Dakin and West fraction is the pure anti-anæmic factor.

Glaxo Laboratories, Ltd.,
Greenford, Middlesex.
W. B. EMERY.
W. J. HURRAN.

CASUALTIES.—Mr. W. MCADAM ECCLES writes: Since damage and casualties are still occurring in southern and sometimes in northern England, though the day of their cessation is drawing near, it is not inappropriate to remind medical officers and others associated with Civil Defence and ARP, that the unique coloured film of *Casualties* is still available for exhibition after having been shown to many thousands of workers. All particulars can be obtained from the manager, Mr. J. Magrill, 17, St. Quintin Avenue, London, W10.

CAMPAIGN AGAINST VENEREAL DISEASES.—The Ministry of Health, in collaboration with the Ministry of Information and the Central Council for Health Education, is maintaining during 1945 the national campaign, launched in 1942, to instruct the public about venereal diseases. Press advertisements, broadcast talks, and films will again be used, and a special display of posters in all parts of England and Wales has been arranged. Local authorities have been asked to coöperate with the Government by making the fullest possible use of the new publicity material offered to them. There is evidence, the Ministry says, that the campaign as a whole continues to have the approval of the vast majority of the public.

Obituary

FRED HOUDLETTE ALBEE

M D HARVARD, F A C S

THE death of F. H. Albee of New York, in his 69th year, removes from the contemporary scene one of the outstanding international figures in surgery. An account of his career and achievements reads like the classical American success story, for Albee "came up the hard way." From a Maine farm, through a country college (Bowdoin), and the Harvard Medical School, he reached the pinnacle of surgical fame, material success in New York, and a large estate in Florida. Throughout the journey, which included a period in general practice in a small town, he showed an intensity of purpose and a driving power paralleled by few men in the history of surgery. His determination to get on, and his early meteoric success, aroused admiration and a following; but also, as time went on, not a little criticism and opposition.

Albee has left his name indelibly imprinted on the technique of bone-grafting in surgery; for he transformed what, even in the hands of such masters as Ollier and Macewen, had been a biological exercise, into an art founded on exact craftsmanship. Looking back to the austere days of his boyhood with the nostalgia of the successful man, he would often recall the debt he owed to his maternal grandfather, a man of Huguenot descent who had been a ship's carpenter, later a house carpenter, and who was in great demand as a tree-grafter in the countryside. The operation of inlay bone-grafting applied by Albee, first in cases of Pott's disease and later in the treatment of delayed union and non-union of fractures, opened a new chapter in reconstructive surgery. In 1913, during the International Congress of Medicine in London, he demonstrated his spinal fusion operation and the motor-driven saw he had designed. In the last war, after a short period of service with an American hospital in France, he organised a large orthopædic centre at Colonia in New Jersey. This gave him full opportunities for the exhibition of his superb craftsmanship in reconstructive surgery, and more especially in the bone-grafting of ununited gunshot fractures. After the war, despite the calls of an ever-growing practice which reached enormous dimensions, he devoted much time and energy to the establishment of curative workshops in New York, and became the chairman of the rehabilitation commission set up by the State of New Jersey to provide for the needs of the disabled of industry. It is sometimes forgotten that in the field of social orthopædics also Albee was a pioneer. He had an instinctive and sentimental interest in the welfare of the cripple. This was part of his social philosophy—the moral materialism which Hamilton Basso has recently described as a characteristic American attitude towards life.

During the years between the two world wars, Albee travelled far and wide in Europe and South America. He was a regular visitor at national and international surgical congresses, where he spoke to large audiences. He would open a discussion, or read his paper illustrated by a cinema film, in characteristic dogmatic and colloquial style. There was no question of argument; he had told them. And as he had no knowledge of foreign languages he could sit back and relax during subsequent discussions. With the late Vittorio Putti of Bologna he was one of the founders of the International Society of Orthopædic Surgery, launched in Paris in 1930. At the time of his death he was vice-president of this body, and he did not conceal his hope of becoming president in the fulness of time. Another of his efforts in international organisation was the foundation of the Pan-American Medical Congress. In the course of his journeys Albee acquired decorations from sixteen different countries, and at the banquets of national and international congresses he appeared with more miniature ribbons than any South American general. Although he submitted good-humouredly to the chaffing of his British colleagues, he showed a schoolboy delight in such tokens of recognition of his fame. He was always in the limelight; he could not efface himself; and the publicity accorded to his activities in the lay press on several occasions unfortunately undermined his status and ethical leadership in the profession of medicine, in his own country. His British friends, who perceived the simple kindly man under the hard-boiled exterior, could naturally take a more tolerant view of such affairs. In retrospect these are small blemishes in the career of a man of outstanding attainments.

Albee has earned a permanent place in the valhalla reserved for the master craftsmen of surgery. Colleagues the world over, and thousands of patients who benefited from his unerring skill, will regret his passing. Like his countryman, J. B. Murphy, he was an individualist and created no personal school, but his influence on the art of surgery will long endure.

CHARLES MACDONELL ANDERSON

M D EDIN.

Dr. Anderson, who died on Feb. 17 at the age of 78, was the son of a colonel in the Sappers who had been through the siege of the Residency at Lucknow, and the nephew of Sir James Outram, also of Mutiny fame. He graduated at Edinburgh in 1889 and then went to the London Hospital and took the Conjoint diploma in 1892. Like many others of his time he went abroad for postgraduate study, to Vienna and Dresden, after which he was assistant in the ear, nose, and throat wards of the Edinburgh Royal Infirmary. Coming South he settled and practised for nine years in Faversham before going to South Kensington where he rapidly acquired a fashionable practice and spent the rest of his life. During the last war he was in charge of the Lady Mary Meynell Hospital for officers and the Red Cross Hospital, Grosvenor Gardens, and he was twice mentioned in dispatches. In this war, though failing in health, he worked all through the blitz days. He was a good physician of sound judgment and even temper, never ruffled or put out, and he had a large circle of friends.

THE LATE PROFESSOR RITCHIE

"As the years pass," writes one of his former assistants, "I am increasingly grateful for my good fortune in starting my professional career under the guidance of
W. T. Ritchie. He dem [illegible] that
at times might seem un [illegible] nore
than he demanded of [illegible] day
round would end at 2 PM, [illegible] the
chief off in his car it was with a realisation that only a concentrated weekend's exertion could cope with the mass of work to be done by Monday morning. But it was a training that none of us would have missed. His Sunday morning rounds, attended by his clinical tutor, house-physician, and juniors, were the outstanding event of the week and were a lesson in clinical acumen and intuition. He could suffer fools, though perhaps not gladly; but knaves never. [illegible]
honesty would rouse him to [illegible]
and anger that were as passio [illegible]
but any honest attempt at a job was given its meed of appreciation. Incompetence was equally detestable to him. Once a house-physician explained that a patient's blood-pressure was not recorded because the baumanometer was broken and the surgery could not supply a spare one. Within two minutes Ritchie was on the telephone to the superintendent, and within ten minutes a messenger arrived post-haste from the nearest instrument-maker with a brand-new machine.

"Quality, not quantity, was Ritchie's aim, and he never published a paper unless he was convinced that it was a contribution to knowledge. It was one of his boasts that no firm of manufacturing chemists had ever been able to quote any paper of his in advertising their products. He belonged to a generation of outstanding cardiologists and his contribution to his specialty has
[illegible] s persistent
[illegible] f auricular
[illegible] y different
had it not been for this self-imposed denying ordinance. But it was not only as a cardiologist that he excelled. He was a first-class general clinician, and after his experience in Egypt during the last war he maintained a keen interest in tropical diseases. One of his great joys was to receive interesting specimens or blood-films from former house-physicians serving in the tropics.

"In W. T. Ritchie we have lost a chief who was also our friend, for whom no trouble was too great provided he could help us."

Notes and News

AMERICAN GIFT TO THE RSM

AMERICA has given much to Britain in the field of anæsthetics—perhaps the most notable gifts were from such men as Wells, Colton, and Morton, who gave the world nitrous oxide and ether anæsthesia—and the war has strengthened the close association between American anæsthetists and ours. Last week Colonel Ralph Tovell, consultant in anæsthetics to the American Army, presented a cinematograph sound projector to the Royal Society of Medicine from the American Society of Anæsthetists as a token of appreciation for the hospitality and coöperation experienced by American anæsthetists in this country. Dr. Frankis Evans accepted the gift on behalf of the section of anæsthetics and handed it over to Surgeon Rear-Admiral Gordon Gordon-Taylor, the president, for the use of the Society. Admiral Gordon-Taylor, as a surgeon, paid tribute to American anæsthesia, which had helped "to remove the dangers and bitterness of the waters of Lethe," and foresaw that the projector would be "no silent memorial but a resonant and lively reminder of American friendship."

WHAT ARE WE?

THE irruption of a physicist into the realms of biology, more particularly genetics, is unusual. Dr. Schrödinger, author of a slender book (*What is Life?* Cambridge University Press. Pp. 91. 6s.), apologises for his temerity, saying that some of us must venture to embark on a synthesis of facts and
theories, or the purp [illegible]
will be frustrated. [illegible]
out that as chemica [illegible]
relate to the reactions of huge numbers of molecules they cannot be expected to be absolutely true of a gene. It contains only about a million molecules, and that number is much too small to entail an orderly and "lawful" behaviour according to physics. Consequently living matter may evade the laws of chemistry and physics. That does not mean that
we shall never be able to give a sim [illegible]
we cannot as yet do so. None th [illegible]
body functions as a pure mechani [illegible]
of nature. But in an epilogue he [illegible]
on the side of the mystics—the core of personality is one with God. Altogether an exciting, thought-provoking book.

PHOTOGRAPHY IN MEDICINE

THE Medical and Physical Society of St. Thomas's Hospital recently held at Godalming an exhibition of clinical photographs covering every aspect of medicine, including pathology, bacteriology, mass miniature radiography, and forensic medicine. Mr. Hennell, official photographer to the Medical Research Council, had lent his collection of coloured photographs of war wounds, and a series of films was also shown, including the British Council film on *Thoracic Surgery*, the Ministry of Health film on *Scabies*, and the recent film on *Spinal Anæsthesia*. Prof. T. P. Kilner, Mr. R. K. Bowes, Dr. J. W. McLaren, and Dr. Eric Gardner opened a discussion on the value of photography and the film in medicine. The students of St. Thomas's are to be congratulated upon their initiative and skill in organising the exhibition which was a convincing demonstration of the rôle photography has come to play in the teaching of medicine.

RELIEF

THE Society of Friends probably has more experience of international relief than any other body, for the Quakers have worked in most of the unsavoury areas of Europe in the
[illegible] h Prof. J. R.
[illegible] Vienna after
[illegible] sh war. The
problems were the same, yet remarkably different. The
[illegible]
relief does not begin and end with food; and clearly it is often better to give help at home than to allow children to be sent abroad. Difficulties not only of transport and supplies but also of coöperation with other relief organisations are frankly discussed, and all hoping to take part in a relief expedition should read their views. But why was the book called *Malnutrition*? It should have been called *Relief*.

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1. Malnutrition (Quaker Work in Austria 1919–21 and Spain 1936–39). By Norah Curtis and Cyril Gilbey. (Oxford University Press. Pp. 87. 2s.)

University of Cambridge

On March 2 the degrees were conferred by proxy of MD on N. H. L. Ridley and of MB, B Chir on Gerald Hartridge.

The Raymond Horton-Smith prize for 1943–45 has been awarded to Dr. F. T. G. Prunty for his essay on hyperfunction of the adrenal cortex.

University of London

The title of professor of chemical pathology in the university has been conferred on Mr. E. J. King, PH D, in respect of the post he holds at the British Postgraduate Medical School.

The title of professor emeritus of chemistry in the university has been conferred on Mr. R. H. Aders Plimmer, D SC, who held the chair of chemistry at St. Thomas's Hospital medical school from 1922 to 1942.

Mr. C. W. Shoppee, D SC, has been appointed to the university readership in chemistry at the Royal Cancer Hospital (Free). Since 1939 he has been working at the Pharmaceutical Institute in the University of Basle.

The degree of D Sc has been conferred on Major P. Granville Edge, a recognised teacher at the London School of Hygiene, and on Dr. William Evans, a recognised teacher at the London Hospital medical college.

Royal College of Physicians of London

Dr. Henry MacCormac will deliver the Lumleian lectures at the college on Tuesday and Thursday, April 17 and 19, at 4.30 PM. The title of his lectures is to be Prospect and Retrospect.

Faculty of Radiology

At 2.30 PM, on Friday, March 16, at the Royal College of Surgeons, Lincoln's Inn Fields, London, WC2, the diagnosis section will meet to discuss non-malignant conditions of the œsophagus. The opening speakers are to be Dr. A. S. Johnstone and Dr. R. A. Kemp Harper.

British Institute of Radiology

On Thursday, March 15, at 8 PM, at 32, Welbeck Street, London, W1, Mr. L. Dudley, AMIEE, will read a paper on the development of Stereoscopic Photography and Radiography.

Biochemical Society

The annual general meeting will be held at Middlesex Hospital Medical School, London, W1, on Saturday, March 17, at 2 PM.

Royal Eye Hospital, Southwark

On Friday, March 23, at 5 PM, Mr. P. M. Moffatt will speak to the clinical society of the hospital on orthoptics.

LCC Physiotherapy Staff

The massage staff of the London County Council are in future to be called physiotherapists instead of masseurs or masseuses. This change is in accordance with the policy of the Chartered Society of Physiotherapy, the name adopted more than a year ago by the former Chartered Society of Massage and Medical Gymnastics.

Association of Industrial Medical Officers

There will be a business meeting of the association at 11 AM on Saturday, March 24, at the London School of Hygiene, Keppel Street, WC1, and at 2.30 PM. Dr. W. Jeaffreson Lloyd, Mr. Joseph Minton, and Mr. T. C. Summers will open a discussion on ophthalmological problems and visual standards in industry.

Royal Society of Medicine

At the section of psychiatry on Tuesday, March 13, at 2.30 PM, Dr. J. Frank will describe psychological experiences in patients undergoing physical treatments. Dr. W. Mayer-Gross and Dr. L. C. Cook will also speak. On the same day, at 5 PM, at the section of experimental medicine and therapeutics, Dr. R. G. Macfarlane, Dr. Harold Scarborough, and Major J. Reid will open a discussion on blood coagulation. On March 14 the section of proctology will meet at St. Bartholomew's Hospital at 3.30 PM, and the section of physical medicine at St. Thomas's Hospital, SE1, at 4 PM. On March 15, at 5 PM, Prof. E. Meirowsky and Dr. Serge Keys will read a paper on the Paget cell to the section of dermatology. On March 16, at 6 PM, at the section of radiology Dr. John Wilkie on radiology of the small intestine.

Tuberculosis Association

A clinical meeting will be held at 2.30 PM, on Friday, March 16, at the Hospital for Consumption and Diseases of the Chest, Brompton, SW3.

Medical Society of London

On Monday, March 12, at 5 PM, at 11, Chandos Street, W1, Dr. E. B. Strauss, Dr. L. C. Cook, and Mr. Wylie McKissock will open a discussion on modern methods of treatment in psychiatry. Dr. Eliot Slater and Dr. William Sargant will show a film demonstrating the technique of convulsion therapy.

Appointments

BROWN, J. W., MD LOND., FRCP: visiting consultant cardiologist, Peterborough Memorial Hospital.

CANNEY, R. L., MB CAMB., FRCS: acting surgical registrar and tutor, Guy's Hospital, London.

FEILING, ANTHONY, MD CAMB., FRCP: medical referee for the county-court districts of Uxbridge (circuit no. 34), Shoreditch and Windsor (circuit no. 39), Bloomsbury (circuit no. 42), Westminster (circuit no. 44), Kingston-on-Thames and Wandsworth (circuit no. 45), Woolwich (circuit no. 47) and the City of London.

HAJDU, NICHOLAS, MD PRAGUE, MRCS, DMR: temp. asst. in the radiodiagnostic department, St. George's Hospital, London.

KLEIN, N. N., MD BRNO, LRCPE, DMRE: radiologist, St. Helier County Hospital, Surrey.

MILLS, P. J., MRCP, DA: medical superintendent, Lister EMS Hospital, Hitchin.

PROCTOR, A. H., DSO, MD, MS DURH., colonel IMS retd: medical superintendent, Southport Emergency Hospital.

Births, Marriages, and Deaths

BIRTHS

ADLINGTON.—On March 1, at Sheffield, the wife of Mr. S. Roy Adlington, FRCS—a son.

ALLEN.—On Feb. 23, at Winchester, the wife of Dr. Wilfred H. E. Allen—a daughter.

BERRIDGE.—On Feb. 27, at Cambridge, the wife of Dr. F. R. Berridge—a daughter.

BION.—On Feb. 27, at Bournemouth, the wife of Major W. R. Bion, DSO, RAMC—a daughter.

BLACHFORD.—On Feb. 26, at Newmarket, the wife of Squadron-Leader R. D. Blachford, MRCP—a daughter.

BOWE.—On Feb. 22, at Cambridge, the wife of Wing-Commander J. C. Bowe, MD, RAF—a daughter.

GOODRICH.—On March 1, at Worthing, the wife of Dr. B. H. Goodrich, RAFVR—a daughter.

PETROVITCH.—On Feb. 27, in London, the wife of Dr. Milorad Petrovitch—a son.

RIPMAN.—On Feb. 26, at Ashford, Kent, the wife of Captain H. A. Ripman, RAMC—a son.

SAMES.—On Feb. 28, at Upton Grey, Hants, the wife of Mr. C. Patrick Sames, MS, FRCS—a son.

SCHOLEFIELD.—On Feb. 27, in London, the wife of Mr. John Scholefield, FRCS—a daughter.

TEGNER.—On Feb. 28, the wife of Lieut.-Colonel W. S. Tegner, RAMC, of Abbey Gardens, N.W.8—a son.

WETHERED.—On March 1, at Clifton, Bristol, the wife of Surgeon Lieut.-Commander R. R. Wethered, RNVR—a son.

WILLIAMS.—On Feb. 22, at Haverfordwest, the wife of Dr. M. H. C. Williams—a daughter.

MARRIAGES

JENNER—IMPEY.—On Feb. 26, at Sutton Coldfield, S. M. Jenner, MRCS, surgeon lieut.-commander, RNVR, to Margaret E. Impey.

STANFORD—BAKER.—On Feb. 14, at Jordans, Bucks, Geoffrey Brian Stanford, MRCS, DMR, FRPS, of London, to Pauline Jane Mary Baker, of Farnham Common, Bucks.

DEATHS

DICKIN.—On Feb. 25, at Brightlingsea, Essex, Edward Percival Dickin, MD EDIN.

GLOVER.—On Feb. 24, in Edinburgh, Henry Joseph Glover, MD EDIN., DTM, DPH.

LAMPLOUGH.—On March 4, at Alverstoke, Hants, Wharram Henry Lamplough, MD DURH., DPH.

MCCRACKEN.—On Feb. 22, at Melrose, James Smith McCracken, MD EDIN., formerly of Newcastle-on-Tyne.

OGILVIE.—In February, 1945, killed in action, Archibald Menzies Ogilvie, MB CAMB., captain, RAMC, aged 29.

RICHMOND.—On Feb. 26, at Trefriw, Benjamin Arthur Richmond, MD LOND., formerly of Ealing, aged 74.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

DECORTICATION IN CLOTTED AND INFECTED HÆMOTHORACES

C. PRICE THOMAS, F R C S
SURGEON, WESTMINSTER HOSPITAL; ASSISTANT SURGEON, BROMPTON CHEST HOSPITAL; SURGEON, EMS THORACIC UNIT

W. P. CLELAND
M B ADELAIDE, M R C P
SURGICAL REGISTRAR, EMS THORACIC UNIT

HORTON EMERGENCY HOSPITAL

Illustrations on plate

HÆMOTHORAX is by far the commonest complication in chest injuries, for it may be associated with any of t [illegible]

187 of 291 cases of chest wounds. Ryle (1940) observes as high an incidence as 80%, while d'Abreu et al. (1944) mention 202 cases in 260 penetrating wounds of chest. In our own series of 750 chest injuries of all types there were 526 hæmothoraces, an incidence of 70%. It can be seen, therefore, that the management and treatment of hæmothoraces will occupy a considerable proportion of the available time and attention at a chest unit.

Hoyle (1940) emphasised the important differences between a simple hæmothorax, where the hæmothorax forms the main or the most important effect of an injury, and the compound or complicated hæmothorax, where the pleural blood is associated with a more serious or important injury to the lung, diaphragm, or chest wall. These latter cases almost all require active surgical treatment, and it is our experience that the associated hæmothorax if removed at the time of operation rarely causes further serious trouble. The simple hæmothorax presents rather a different problem; with adequate treatment the majority resolve rapidly and completely. The mortality and morbidity, however, in these cases almost entirely depend on the occurrence of infection or massive clotting in the hæmothorax. Tudor Edwards (1943) records an incidence of infection of 21·9% in hæmothoraces. Nicholson and Scadding (1944) find a third of their 291 cases infected, while d'Abreu et al. mention 77 infected cases out of 260. We observed 162 empyemata in 526 hæmothoraces—an incidence of [illegible]
common;
exhibiting
Nicholson
ases. We
nothoraces
were clotted, the incidence in the various groups being as follows:—

Group		*Total hæmothoraces*		*Clotted hæmothoraces*
Dunkirk	.. ..	61	. ..	4
Air-raids	.. ..	143	.. ..	6
Middle East	.. ..	46	. ..	3
Western Europe	.. ..	185	.. ..	35
Other sources	.. ..	91	..	nil

In this paper we propose to discuss the clinical and radiological features and treatment of clotted and infected hæmothoraces, and to describe the operation of decortication and its postoperative management.

Uninfected Clotted Hæmothorax

As far as we know no satisfactory explanation of the occasional occurrence of clotting, or perhaps more significantly the usual absence of clotting, in hæmothoraces has been put forward. The associated tissue damage with the liberation of thromboplastic substances may play a part. Wilson (1913) maintains that lung movements may defibrinate the blood so that extensive clotting is preventc [illegible]
larly be implicat
examination of the
deficiency either
substances in most
of these deficienci
clotting. He says
cases. Dilution with serous fluid does not appear to be an important factor, since blood-counts and hæmatocrit estimations often indicate that, in the very early stages, a fluid hæmothorax is composed of almost pure blood.

Infection has been suggested as a cause but in many cases of massive clotting no organisms have been found even after a long and careful search. Undoubtedly infection occurs in some but by no means in a significant majority of cases. Nicholson and Scadding find 6 infected out of 12 cases of clotted hæmothorax; 18 of our 48 clotted cases were infected, and this represents an infection incidence almost identical with that for the whole series. Delay in aspiration has been blamed for the clot formation but if it is a factor it is not the sole one, since massive clotting has sometimes occurred at the time of the first exploration within a day or so of injury (see table I).

The increased incidence of massive clot formation observed in our casualties from the Western European campaign may possibly be due to the employment of intrapleural penicillin as a [illegible] *
but in-vitro experiments
view. The extensive use
unfortunately been associated with a tendency to disregard the principles of early and frequent aspiration of blood from the pleural cavity so that *many cases remain* virtually unaspirated for a considerable period. An additional factor may be the high proportion of mortar [illegible]
incidence of clotted
Lush et al. suggest,
entirely to improved diagnosis; base hospital conditions render this suggestion unlikely. However, in the earlier phases of the Western European campaign our units were treating the more seriously injured cases reaching this country, and these probably included an unduly high proportion of clotted hæmothoraces.

CLINICAL AND RADIOLOGICAL FEATURES

Two fairly distinct types of clotted hæmothorax have been encountered. One shows radiologically multiple pockets containing air and fluid separated by strands, bands, or sheets of fibrin. Pockets are often shut off from each other and their contents may vary from sterile serous fluid to frank pus. The second variety encountered is the massive clot. In these the clot is usually in one or a relatively small number of pieces, sometimes weighing as much as a pound.

The different appearances of these two types are, we believe, due to the presence of air in the pleural cavity in the early stages. Such air may have come from the lung or through the wound or have been intentionally introduced during air-replacement. It is unlikely that gas produced by anaerobic organisms can wholly account for the differences; many multilocular cases are sterile, while infection of a massive clot with gas-forming organisms gives rise to a sponge-like appearance radiologically. Gas-forming organisms undoubtedly accentuate the appearances of the multilocular variety, and in many such cases the gas in the loculi is found at operation to be under considerable pressure.

The physical signs of the clotted hæmothorax are essentially those of pleural fluid. In the multilocular cases areas of tympany and dullness may alternate. Breath sounds are usually absent but are sometimes present and bronchial in character. The occurrence of bronchial breath sounds depends on the state of the underlying lung and they are most usually heard when it is atelectatic. This probably accounts for the haphazard appearance of bronchial breathing in any type of hæmothorax. Bronchial breath sounds cannot, therefore, be of diagnostic importance in the clotted hæmothorax.

The radiological features are sometimes distinctive but are commonly the same as in any pleural effusion. In the multilocular cases the appearance of multiple fluid levels is characteristic but the condition may simulate the shadows thrown by the alimentary tract so that a diaphragmatic hernia may be suspected. Sometimes the fluid level is interrupted by the projection of a fibrin mass above the surface. Later cases with
clotting show a sharply defined opacity as org
and contraction proceed, and small clots may

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* See Sellors, T. H. *Lancet*, Feb. 3, 1945, p. 143 (published after this paper was written).

oval or spherical shape resembling a chest-wall tumour or a peripheral growth of the lung.

DIAGNOSIS

Apart from the classical radiological pictures described above, the final diagnosis of clotting depends on the surgeon's inability to aspirate blood in reasonable quantities with an aspirating needle. Small quantities of blood can be aspirated even when a massive clot is present, because a little fluid blood is shut off in loculi in the clot. Too often, therefore, the aspiration of two or three ounces of fluid blood has led to the useless continuance of conservative treatment with unfortunate delay in the employment of more active measures. Inability to aspirate blood from a hæmothorax does not always mean that clotting has occurred. The aspiration site may be too low because allowance has not been made for the usual rise in the diaphragm after injury. Too small a needle may be employed, or the needle may be repeatedly blocked by small fibrinous tags floating in the fluid.

PATHOLOGY AND COURSE

Much blood can unquestionably be absorbed from the pleural cavity. But even in minimal cases there is a certain amount of organisation and fibrous tissue formation, as shown by the fact that small intrapleural injections of blood have been successfully employed for the therapeutic production of pleural adhesions. In the case of larger collections considerable fibrous tissue formation occurs; this may form a resistant corset often an inch or more thick around the lung between it and the chest wall, producing a condition suitably termed the "frozen chest." Organisation with fibrous tissue formation occurs with great rapidity in a hæmothorax, and apparently takes place earlier and is more extensive in clotted cases. This may well be due to the presence of a suitable fibrinous scaffolding. Histological examination of the coating on the visceral pleura in several hæmothoraces of less than two weeks' duration has shown well-developed fibrous tissue even at this early stage. Nearest the pleura the cells and their fibres lie parallel to the pleural surface, while more peripherally the cells are more vertically placed, the tissue is more vascular, and fewer collagenous fibres are present. The appearances are those of granulation tissue with scattered islands of fibrin among the cells. Still more peripherally is an irregular mass of fibrin and leucocytes. This appearance has been encountered in every case where the membrane on the pleura has been examined. It is true granulation and fibrous tissue, and represents the results of organisation of the blood. We cannot agree with Wilson (1943), or with Lush, Nicholson et al. (1944), who consider that the layer is fibrinous. It is possible that at first fibrin is deposited on the pleura but organisation follows so rapidly that for practical purposes the membrane must be regarded as composed of fibrous tissue.

TREATMENT

The treatment of the clotted hæmothorax has passed through interesting evolutionary phases during this war. We propose to outline these various methods and discuss their drawbacks and disadvantages. The present technique largely overcomes these disadvantages and ensures rapid re-expansion of the lung with a minimum of residual chest deformity and rigidity.

(1) *Natural absorption.*—Small clotted hæmothoraces can be absorbed or organised to such a degree that little residual disability remains. There are records of larger clotted hæmothoraces which have behaved similarly, but more commonly there is considerable fibrous tissue formation, often with calcification or ossification later, leading to a deformed and immobile or "frozen chest."

(2) *Simple evacuation of clot.*—This was the first active operative measure undertaken in an attempt to overcome the disabilities of the frozen chest. Success was achieved in some early cases: but in many the lung failed to re-expand fully and a residual pleural pocket remained, which in spite of repeated aspirations was gradually obliterated by fibrous tissue, leaving the crippling deformity of the frozen chest.

(3) *Evacuation of clot with decortication.*—It became obvious after a little experience with simple evacuation that decortication or removal of the fibrous tissue layer on the visceral pleura was required to permit the underlying lung to re-expand completely and obliterate the pleural space. In the smaller hæmothoraces local removal of this layer from the lung bordering the cavity was successfully employed. In the more extensive cases, however, it appeared advisable to decorticate and completely free the entire lung so that it could be allowed to expand into the thorax unhampered by any unnatural adherence. This seemed a desirable step because we found that on many occasions the lung became adherent in an unnatural position. The upper lobe "toppled over," and the apex became adherent to the chest wall well below its normal position. Such adherence prevented the lung from resuming its normal position after decortication. Again it was found that the diaphragm was often considerably raised and the costophrenic sinus obliterated. Mobilisation of the diaphragm and the diaphragmatic surface of the lung not only allowed the lung to descend into the sinus but also increased diaphragmatic mobility.

The ultimate success of the operation seemed to depend on obtaining rapid and complete re-expansion of the lung with obliteration of the pleural cavity. Failure to achieve this often left the patient little better off than before operation. If a pleural pocket remains fluid accumulates rapidly, and, although it can be removed at intervals by aspiration, pleural thickening with its train of disabilities soon follows (figs. 1 and 2). In many cases infection appears in these pockets with the consequent hazards and morbidity of an empyema.

Closure of the thoracotomy wound without drainage appeared to minimise the chance of early and complete lung re-expansion and has only occasionally been used. Simple drainage by a low posterior intercostal tube attached to a water seal was at first employed. However, early and complete expansion was not obtained, for the lower lobe expanded early, and, covering the tube, sealed it off from the remainder of the pleural cavity, leaving an anterior or apical pocket of air. Repeated aspirations failed to obliterate the space before a considerable degree of "pleural thickening" or infection occurred. In an attempt to overcome this pocketing a second tube was inserted into the apex of the pleural cavity through the second or highest available intercostal space between the scapula and the vertebral column. This tube was also attached to a water-sealed bottle. But once more early and complete re-expansion of the lung was not realised.

At this stage the effect of active suction was tried, employing a negative pressure of 4–6 cm. Hg. The results were dramatic, and even the most sluggish lung expanded rapidly and completely (figs. 3–8). Since then we have employed suction in every case; and so far have not failed to obtain full expansion of the lung and particularly of the apex. In some infected cases empyemata have recurred but these have been limited to the base while the upper lobe and apex of the lung have remained firmly attached to the chest wall, thus preventing a total empyema. Firm adherence between the decorticated lung and the chest wall appears to occur within 5–6 days. This is a factor of some importance, for a lacerated lung can in some cases be rendered "airtight" for several days by suture; if during this period the lung can be approximated and fused to the chest wall, the eventual bronchopleural fistula will be followed not by a total but by a localised empyema.

OPERATIVE TECHNIQUE

An intercostal posterolateral approach through the 6th space, with resection of a segment of the 6th rib posteriorly, is employed for all but the small localised cases. In this latter group the incision is placed over the affected area. Good wide access is essential if the apical and diaphragmatic regions are to be reached easily. Blood and clot are first removed from the pleural cavity. The lung is then found encased in a red smooth membrane, with little or no respiratory excursion. This membrane is carefully incised until the grey shining layer of visceral pleura is encountered. A plane of cleavage is readily found between the pleura and the fibrous coat, and the latter is carefully removed from the lung by blunt dissection using the finger or a large curved hæmostat either closed or with a small swab in its jaws. Care must be taken to avoid lacerating the

TABLE I—RESULTS OF CLOTTED HÆMOTHORACES TREATED BY VARIOUS METHODS

Type of clotted hæmothorax	First aspiration days after wounding	Organisms	Operation time after wounding	Drainage	Result
NATURAL ABSORPTION					
Massive clot	13	Sterile			Poor gross pleural thickening
Basal clot	6	Sterile			
Basal clot	18	Sterile			
EVACUATION OF CLOT					
Basal clot	[illegible]	Clostridia, streps	1 month	Perm	Poor total chronic empyema
Massive clot		Sterile	2 days	Nil	Poor, basal empyema
Localised clot	5	Sterile	6 weeks	Temp	Excellent
Basal clot	2	Sterile	18 days	Temp	Excellent
Massive clot	90	Sterile	3 mths	Temp	Poor large residual pocket
Basal clot	4	Gram pos bacilli	7 days	Temp	Fair residual pocket and basal empyema
Massive clot	2	Sterile	4 mths	Temp	Poor large residual pleural pocket and gross pleural thickening
Multil hæmoth	7	Clostridia	3 weeks	Perm	Fair basal empyema
Massive clot	2	Clostridia staphs	6 weeks	Perm	Poor, basal empyema
Multil hæmoth	8	Clostridia staphs	5 weeks	Perm	Poor, total empyema
Massive clot	12	Sterile	3 weeks	Nil	Fair residual pocket moderate pleural thickening
Massive clot	1	Sterile	14 days	Temp	Poor residual pocket and empyema
Loculated	2	Sterile	8 days	Temp	Poor, residual pocket and empyema
Massive clot	14	Streps	4 weeks	Perm	Poor, empyema
Massive clot	14	Sterile	18 days	Temp	Poor, empyema
Massive clot	7	Gram pos bacilli	4 weeks	Perm	Poor total empyema
Massive clot	7	Sterile	20 days	Nil	Fair residual pocketing and pleural thickening
Basal clot	5	Sterile	28 days	Nil	Fair, large residual pocket
Massive clot	5	Sterile	12 days	Temp	Good moderate residual pleural thickening
Massive clot	2	Sterile	10 days	Nil	Fair residual pocketing and pleural thickening
Massive clot	8	Sterile	21 days	Temp	Fair residual pockets and moderate pleural thickening
Massive clot	3	Sterile	5 days	Temp	Fair residual pocketing
Loculated	6	Sterile	9 days	Temp	Poor, residual pocketing and empyema
Loculated	5	Sterile	21 days	Temp	Poor residual pocketing and empyema
Massive clot	7	Infected	15 days	Temp	Poor residual empyema
DECORTICATION WITH SIMPLE DRAINAGE					
Loculated	4	Sterile	6 weeks	Temp	Poor, residual pocket and empyema
Basal clot	1	Sterile	17 days	Nil	Excellent
Loculated	6	Sterile	18 days	Temp	Fair, small residual pocket with pleural thickening
Loculated	8	Sterile	28 days	Temp	Fair residual pocket with pleural thickening
Massive clot	10	*Ps pyocyanea*	8 weeks	Perm	Poor residual basal empyema
Loculated		Coliform streps	3 weeks	Perm	Poor, total empyema
Loculated		Sterile	3 weeks	Temp	Good
Basal clot	1	Sterile	14 days	Temp	Excellent
Loculated	1	Sterile	18 days	Temp	Fair small residual pocket and moderate pleural thickening
Massive clot	1	Sterile	5 weeks	Temp	Fair, several pleural pockets and moderate pleural thickening
Massive clot	3	Sterile	4 weeks	Temp	Fair slow expansion of lung moderate residual pleural thickening
Loculated	2	Sterile	9 weeks	Nil*	Poor residual pocket basal empyema
Loculated	3	Sterile	21 days	Temp	Fair residual pleural pocket with moderate thickening
Loculated	5	Sterile	21 days	Temp	Fair residual pocket and pleural thickening
Massive clot	2	Sterile	8 days	Temp	Fair moderate residual pleural thickening
Massive clot	2	Sterile	12 days	Temp	Fair, residual pocket and pleural thickening
DECORTICATION WITH SUCTION DRAINAGE					
Massive clot	4	*B proteus* coliforms	3 weeks	Suct	Good
Massive clot	5	Sterile	4 weeks	Suct	Excellent
Loculated	6	Sterile	3 weeks	Suct	Good
Loculated	5	Sterile	4 weeks	Suct	Excellent
Massive clot	2	Sterile	24 days	Suct	Good slight basal pleural haziness
Loculated	4	Sterile	4 weeks	Suct	Good

Temp = temporary Perm = permanent Suct = suction drainage
Multil hæmoth = Multilocular hæmothorax
* Local decortication only

pleura but a number of small tears seem unavoidable

soon ceases

It is inadvisable to try to remove the coating from the lung immediately adjacent to a lung wound whether healed or unhealed, for to do so merely results in considerable pulmonary laceration In such cases the in around the wound traumatic or operative air at the conclusion of with fine catgut of the diaphragm

If the diapl . fibrous tissue coat

this coat should be removed and the costophrenic sinus re formed by breaking down the obliterating adhesions The fibrous coating on the parietal pleura should then be removed as completely as possible It is often a difficult task for purely mechanical reasons However, less care is required in stripping except when the coat extends on to the mediastinum, it is often possible to

limit

chest nt to remove this layer to achieve the best functional results

Intercostal drainage tubes are now inserted into the apical and basal regions of the pleural cavity. The apical tube (no. 8 Jacques catheter) is inserted through the highest available intercostal space between the vertebral border of the scapula and the vertebral column, while the basal tube (medium bore straight tube with a side hole) is inserted at the rib angles about 2 in. from the lower limit of the pleural cavity. The thoracotomy wound is then closed in layers.

During and after the operation transfusion of whole blood is employed; 2–3 pints of blood is usually necessary, because shock may be severe, the patients are often poor operative risks, and hæmorrhage although rarely excessive may be significant.

Anæsthesia.—'Pentothal' with closed positive pressure intratracheal cyclopropane and oxygen has been used in most cases. Where fistulæ have been large, nitrous oxide, oxygen, and ether have replaced the cyclopropane.

POSTOPERATIVE MANAGEMENT

In the first place and for as long as demonstrable bronchopleural fistulæ are present both tubes are connected to water-sealed bottles. When the fistulæ have closed—usually about 12–36 hours after operation—both tubes are connected by a Y-shaped connexion to an electric suction pump. The pressure is reduced as rapidly as can be tolerated to 5–6 cm. Hg. In no case should suction be started until the patient is propped up on pillows after the operation. If suction is started when the patient is horizontal there is a danger that the upper lobe may seal the upper catheter and leave an anterior pocket of air shut off from the tube. Suction is maintained for 2–3 days, when, if the lung is fully expanded, the tubes are removed; precautions should be taken to see that no air leaks along the tube tracks after removal of the tubes.

Too early removal of the tube may occasionally result in pleural pockets of air from recurrence of a bronchopleural fistula, but after several days the lung has probably adhered to the chest wall and separation is then unlikely. If air pockets reappear after removal of tubes we consider it wise to insert a small catheter and reinstitute suction rather than rely on aspiration. Aspiration does not lead to the desired rapid re-expansion of the lung and so favours fibrous tissue formation.

In some cases a pleural exudate appears, particularly at the base, but in none of these have we been able to aspirate more than a few c.cm. of serous fluid and we believe that the exudate is largely fibrinous. Careful follow up shows that these exudates are fairly rapidly and completely absorbed.

RESULTS

Table I shows the results obtained in 50 cases of both sterile and infected clotted hæmothorax treated by the various methods already described. In many of the more recent cases, treated at transit hospitals, assessment was made relatively soon after operation, but even at this early stage it seems accurate. The cases in which suction drainage with decortication has been employed have been retained until convalescent. No final analysis can be made at this stage because the period since operation is often too short. In recording results, "excellent" implies full re-expansion of the lung with no demonstrable pleural thickening; "good" indicates full re-expansion with slight residual haziness seen radiologically; "fair" suggests pleural pocketing with moderate subsequent pleural thickening; while "poor" indicates gross pleural thickening or empyema formation.

Infected Clotted Hæmothorax

Infection occurs in about 30% of clotted hæmothoraces. Lush, Nicholson et al. record a higher figure of 21 out of 45 cases. There is not, therefore, a significantly higher rate of infection among clotted than among fluid hæmothoraces, though infection has been suggested as a factor responsible for clot formation.

Infection should be suspected in the presence of pyrexia, tachycardia, or leucocytosis; unexplained rapid loss of weight is often due to infection. It is not always possible to obtain bacteriological confirmation on aspirated material owing to the frequency of loculation and the fact that various loculi may exhibit markedly different cytology and bacteriology.

The radiological features are often distinctive. In the multilocular variety the loculi often appear to be under tension so that the cavities appear more spherical than usual. (These cases often exhibit visible enlargement of the affected side of the thorax.). In cases with massive clot the sponge-like mottling due to imprisoned gas bubbles is quite distinctive; gas-forming anaerobic organisms are usually found in these.

TREATMENT

(1) *Drainage.*—Earlier cases were subjected to a minor thoracotomy, usually placed at a low level where drainage would subsequently be employed. As much clot as possible was removed through the bed of a resected rib segment and the remainder left to liquefy. Drainage was then instituted through a tube placed either through the thoracotomy wound or at a lower level if the latter was placed too high. This procedure adequately controlled the infection but in many cases total empyemata resulted which slowly obliterated over a period of months or years leaving considerable final disability (figs. 9–11).

(2) *Sterilisation and decortication.*—Recently, with the advent of penicillin and in the light of experience with decortication, a much more satisfactory approach has evolved. The first aim is to sterilise the hæmothorax with penicillin if the organisms are sensitive. Three or four intrapleural injections of 60,000 units are made at intervals of 2 days. In many this will suffice to render the cavity sterile, but some cases, particularly the multilocular ones, are impossible to sterilise in this way owing to the difficulty of reaching all the pockets. In such cases it is useless to waste time in attempting sterilisation.

Thoracotomy with complete decortication is then carried out as already described and the decorticated lung expanded by active suction, using apical and basal tubes (figs. 12 and 13). We have employed a penicillin drip through the apical tube for 12–24 hours before employing suction, 100,000 units of penicillin being added to a pint of sterile water in a blood-transfusion bottle (EMS pattern) and the bottle connected to the apical tube with drip device. The rate of flow is adjusted so that a pint of fluid enters the chest in 18–24 hours (12–15 drops per minute). The penicillin drains out through the basal tube.

BACTERIOLOGY

Many and varied organisms may be found in an infected hæmothorax; the commoner ones are streptococci, staphylococci, pneumococci, *B. proteus*, *Ps. pyocyanea*, coliform organisms, and *Cl. welchii*. Several significant observations have been made during the postoperative course of decorticated infected cases.

(1) Streptococci and staphylococci, even though banished for some time from the hæmothorax by penicillin, show a tendency to recur in the discharge after decortication. The penicillin drip through the apical tube appears to prevent this reappearance in some cases.

(2) *B. proteus*, *Ps. pyocyanea*, and coliform organisms commonly disappear completely after decortication. In cases infected with these organisms alone the effluent discharge is often sterile and remains so. These organisms may in fact be saprophytic and will only persist while an empyema cavity remains. Once such a cavity is obliterated the organisms either die out or are effectively controlled by the defences of the body.

(3) *Cl. welchii* behaves in a peculiar way in the hæmothorax. It is well known that anaerobic gram-positive bacilli may be found in hæmothoraces where infection was quite unsuspected. Tudor Edwards (1943) points out that general signs of infection and toxæmia may only appear when infection with pyogenic cocci is added. We have been struck with the frequency of toxæmia in pure anaerobic infection in clotted as opposed to fluid hæmothoraces; it is possible that protein in the form of a gel instead of a sol may be one of the factors concerned in this difference. Clostridia do not persist in the pleural discharge after effective removal of blood or clot; it is most unusual to find them in the discharge even as early as 24 hours after decortication.

Empyema following Hæmothorax

Recent experience with clotted hæmothoraces—particularly the encouraging results of decortication and suction drainage—has led to a modification in the approach to the empyema following a hæmothorax.

CLOSED EMPYEMA

At the beginning of this war an infected hæmothorax was drained as soon as infection was suspected or organisms found in aspirated fluid. Results were not good and the incidence of total empyema was high. Early drainage was therefore soon replaced by repeated aspiration followed by drainage when the empyema was walled off by adhesion of the surrounding lung to the chest wall. Eventual healing and obliteration of the empyema was achieved in the majority without resort to other operative procedures such as thoracoplasty or a modified Schede operation. The time required for healing was in many cases long—sometimes more than a year—no doubt because of the excessive fibrous tissue formation on the visceral pleura.

When penicillin became available at the time of the Normandy invasion sterilisation of many empyemas was obtained by intrapleural injections, but as a rule pus continued to be formed and in most cases drainage was eventually required. The healing of such cases did not

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shortened, and for this

icillin was an important advance.

At this stage our successes with suction drainage after

in a limited number of cases have been eminently satisfactory.

Suction drainage of an infected hæmothorax without decortication of the lung may produce obliteration of the

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contact has been maintained for over a week; when suction is discontinued the lung often returned to its original position. Presumably the smooth fibrous tissue coverings on the visceral and parietal pleura do not encourage rapid fusion, so that mutual contact results in irregular or even complete absence of adherence.

OPEN OR DRAINED EMPYEMA

Emboldened by our success with closed empyemata, we next tried decortication in drained empyemata and total pyothoraces. Once more the results have been highly satisfactory. In the majority complete expansion of the lung has occurred, the organisms have disappeared from the pleural cavity, and rapid cure of the empyema has resulted (figs. 17–19). In some of the total pyothoraces basal collections of pus have formed and required drainage, but the upper lobe has fortunately remained adherent to the chest wall and a total empyema has thus been avoided.

On the whole these patients are not as suitable for operative procedures as the former groups because their general condition is usually poor—they are pyrexial, toxic and wasted. Sometimes large open wounds or drainage holes are present at the site of election for the thoracotomy incision. In many the scapula is fixed, preventing access to the sixth space, and in most cases crowding and fixation of the ribs limits exposure. For these reasons the operation i

and the patient less well able

In spite of these drawbacks we are convinced that the operation is more than justified and in every case effects tremendous improvement if not rapid cure.

The results in a small series of both drained and undrained empyemata are recorded in table II. In every case considerable gains followed the operation. In all but 2 cases the empyema rapidly resolved in a few days; in 1 case, with a total empyema and a large ulcerated area of lung, expansion of the upper lobe was obtained but a small basal empyema developed which was obliterated a few weeks later. In the other case local decortication with removal of a pleural foreign body

TABLE II—RESULTS OF EMPYEMATA TREATED BY DECORTICATION AND SUCTION DRAINAGE

Type of *empyema*	Organisms	Operation: weeks after wounding	Complete (C) or local (L) decortication	Result
Total drained ..	*Ps. pyocyanea*, *B. proteus*	8	C	Good; complete expansion; moderate pleural thickening
Total undrained	Streps., *Ps. pyocyanea*	6	C	Ditto
Large drained ..	*B. proteus*, coliforms, streps.	10	L	Fair; small residual empyema
Total undrained and lung abscess	*Staph. aureus*	6	C	Excellent; full expansion; no residual pleural thickening
Total drained ..	Coliforms	10	C	Fair; complete expansion of apex; basal empyema healed in 6 weeks
Total drained ..	Hæm. streps.	5	C	Excellent; full re-expansion; slight *pleural thickening*
Basal undrained	*Staph. aureus*	8	L	Excellent; slight residual pleural *thickening*

was employed but the lung did not expand fully after operation, so that coliform organisms persisted in the effluent and the patient retained a small basal empyema which is rapidly healing. Most of these cases were seen some weeks after injury and the onset of infection; by this time considerable deformity with loss of mobility of the chest was already present combined with excessive "pleural thickening." These factors reduced the prospects of achieving excellent results with no residual pleural fibrosis.

Conclusions and Summary

Early and complete obliteration of the pleural space is the most important single f
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this serious group of cases and will correspondingly lessen the anxiety of those charged with their management.

Hæmothoraces occurred in 526 (70%) cases in a series of 750 chest injuries. Infection was present in 30% and clotting in 9% of the hæmothoraces.

The clinical and radiological features of the massive clotted and loculated hæmothorax are described.

Our present method of decortication with suction drainage is described with operative details and management; the results in a limited series of hæmothoraces have been considerably better than those of earlier procedures.

A small series of both drained and undrained empyemata following hæmothoraces have also been treated by decortication and suction drainage. The results recorded are far superior to those achieved by present-day methods.

We wish to thank Mr. N. R. Barrett for permission to include some of his cases in this series.

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X RAYS IN DIAGNOSIS AND LOCALISATION OF GAS-GANGRENE

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Illustrations on plate

IN the present war cases of gas-gangrene have been far fewer than they were in 1914–18, but the disease still remains one of the principal causes of death from wounds. According to MacLennan and Macfarlane (1944) the case-fatality rate has been about 50%.

Gas-gangrene may follow the most trivial wound. In war-time, anaerobic infections of wounds occur very frequently, but in nearly all cases, with efficient treatment, the infection is overcome. If attention to the wound is delayed, the organisms may multiply in blood-clot or dead tissue without serious ill effects, but once they start to invade healthy tissues the disease may run so swift a course that the patient is dead within a few hours.

Everyone admits that successful treatment of gas-gangrene depends on its early recognition. Even the experienced surgeon finds this very difficult, and he must not amputate a limb which can be saved, nor procrastinate until it is too late to save the patient's life. *War Memo No.* 2 (1943) gives the early symptoms and signs of gas-gangrene as follows:

(1) Increasing pain in the wound area, with possibly the appearance or increase of local swelling.

(2) A rising pulse-rate in the absence of continued hæmorrhage and after shock has been overcome.

(3) A change in the mental attitude of the patient, which is difficult to define with accuracy; this change may be one of mental apathy or sometimes euphoria, with or without restlessness.

(4) A wound which is relatively dry, or, at most, shows a thin discharge, the exposed muscle and fat at times being stained a plum colour from hæmolysis.

Occasionally, unexplained attacks of vomiting may occur in the early stages.

Unfortunately, not one of these signs alone is sufficiently distinctive, and if all are present together the patient's condition is already grave. Some method is required for examining suspicious cases which will establish an early diagnosis; with this some reduction in the fatality-rate might be achieved.

DIAGNOSIS BY X RAYS

During the last war a number of observers noted that it was possible to detect gas in the tissues by means of X rays. In this country Dr. J. F. Brailsford is our foremost authority. He believes that it is possible to give an immediate answer to the question, "Is there any evidence of gas-gangrene?", long before the infection has produced serious clinical signs.

In the early days of the present war, limbs were amputated because gas was detected by X rays. The men who did these amputations can have known little about gas-gangrene and still less about radiology, but unfortunately they influenced more experienced surgeons, who in turn taught that radiology was useless in the diagnosis of gas-gangrene. In *War Memo No.* 2 the value of radiology is dismissed in a few words. "In some cases gas bubbles may be seen in X-ray films taken before operation, and this finding may be of value in supporting the diagnosis of an anaerobic infection. It should be remembered, however, that gas may be shown apart from the existence of true gas-gangrene, and that its extent often has no relationship to the clinical state."

Our Russian allies seem to have had more success and have achieved a notable reduction in the case-fatality rate. In a review of 171 cases of gas-gangrene collected during the first Finnish campaign, Ryvline (1940) reports that radiography is a valuable ancillary enabling one to study the distribution of gas bubbles. Out of 171 cases 131 were X rayed and 105 showed gas in the tissues. Though in 26 cases no abnormality was detected. Ryvline holds that X rays are capable of revealing gas formation before clinical signs appear and that early repeated examinations of suspicious cases are valuable. The total fatality-rate in this series was 7·6%; several other Russian sources have reported fatality-rates below 20%.

The use of X rays in the diagnosis of gas-gangrene is not just a matter of detecting gas, for there are several causes other than gas-gangrene which give rise to gas in the soft tissues.

AIR IN THE SOFT TISSUES

All fresh wounds, even a tiny needle puncture, may permit air to enter the tissues. Sometimes gas crepitations may be detected clinically, or bubbles may be seen in the depths of the wound, but in most cases air is not observed unless the part is radiographed.

Air appears as radiotranslucent bubbles, pockets, or streaks in the soft tissues (fig. 1). It is seldom confined to the track of the wound, being widely dispersed in the surrounding loose cellular spaces. Air may extend throughout the entire length of a limb, but it never infiltrates the muscles unless it is forced in under pressure.

The amount and distribution of air in the tissues vary according to whether the wound is open or closed, and with the amount of tissue which has been lost. Air in the tissues is seldom detected in ordinary civilian casualties. One reason for this is that the radiograms of injured persons are usually taken to show the bones, and definition of the soft parts is obscured or lost in the blacker parts of the negative. A more important reason is that in most cases the injured part is soon put at rest by efficient first-aid. If a wounded part is not immobilised, movements, active or passive, tend to suck air into the tissues. A recent case illustrates this point.

A young man who had sustained a pitch-fork wound in his leg was seen in hospital 6 hours after the injury. He had a temperature of 100° F and a raised pulse-rate. Crepitations could be felt in his thigh and around the knee-joint. The wound was slightly uncomfortable and the tissues around it were a little tender. Radiograms showed bubbles of gas in the popliteal space, in the subcutaneous tissues of the leg and in the knee-joint. The surgeon was worried because he could not explain the presence of gas; but further questioning disclosed that the patient had walked two miles to the nearest doctor without a dressing. The radiographic appearances were not alarming, for the gas was almost certainly air. The surgeon disclosed a dirty wound involving the knee-joint. The patient made a complete recovery.

In war-time civilians are exposed to the same conditions as Service men. In a series of air-raid casualties, radiographed within 6 hours of injury, considerable quantities of gas were visualised in 19 out of 31 cases, and nearly all the remainder showed traces of gas in the tissues. These cases were treated quickly and efficiently and did very well. I believe that the explosive forces were in part responsible for so much air in the tissues, for none of these patients had any protection from blast: they were working in the open and in some cases their wounds were very small. A recent experiment seemed to prove this point: a human cadaver was exposed to a relatively small explosive force applied to the foot, which caused a small wound in the thigh, and radiographic examination showed a large quantity of gas in the limb with a distribution similar to that observed in many clinical cases.

Battle casualties may show a great deal of air in the tissues. In a series of recent casualties who were evacuated by air ambulance from France and radiographed within 6 hours of admission to hospital, gas was recorded in the tissues in 89 out of 331 cases. In many cases only single projections of the injured part were taken and no special attempt was made to see or record every gas bubble. These included 7 cases of gas-gangrene and a number of others where the gas was almost certainly due to local formation by organisms in the wound. In most cases there was no reason to suspect that the gas was not air, for the men were kept under constant clinical observation and some were re-examined radiographically; within 3 days most of the gas had disappeared.

AIR ESCAPING FROM AN INJURY TO THE LUNGS

In one of our recent cases (fig. 2) a radiogram of the chest showed gas outlining the fibres of the pectoralis major muscle on the left side, as well as well-marked subcutaneous emphysema in the neck and the left arm.

The patient had a small penetrating wound of his chest in the pectoral region and with each breath he could be seen to blow air from his chest into the pectoral muscle. The radiographic picture of this muscle was very like the appearance given by fulminating gas-gangrene.

Dr. Brailsford recorded similar findings in 1941, and he tells me that he has since seen a similar case where air was infiltrating the trapezius. He thinks that the same changes could be seen in any muscular wound which communicates with the respiratory passages. There is no difficulty in making a correct clinical diagnosis in these cases.

EFFECT OF TREATMENT ON THE PRESENCE OF AIR

Once the injured part is placed completely at rest, air is quickly absorbed. In 24 hours the amount is considerably less, and within 3 days all but a trace has gone. The rate of absorption seems to vary in different tissues, being quicker from muscle and synovial membrane than from areolar tissues. If the tissue is dead there is no absorption of air.

[illegible] this is not always possible or even desirable. From a radiographic standpoint, the best splint is probably a plaster gutter which can be removed for radiography. The various forms of frame splinting are all open to the suspicion that they allow some movement, and if the injury is near one of the natural flexures it is almost impossible to introduce a radiographic cassette without varying the amount and distribution of air in the tissues.

Many other factors in treatment may influence the radiographic picture. Air can be introduced by changing a pack, removing a stitch, or by irrigation. In a recent case X rays showed a great deal of air which had been introduced without the surgeon's knowledge during the manipulation of an intramuscular penicillin drip. Soft paraffin gauze tends to impair t[illegible] holds it in pockets on the skin [illegible] the tissue spaces have become [illegible] do not usually suck more air into the tissues, but any subsequent operation may permit air to enter.

Thus the treatment adopted must be considered when assessing the significance of gas bubbles in the tissues.

LOCAL FORMATION OF GAS

Local formation of gas in the depths of a wound by gas-for[illegible] pearances which cle[illegible]. 3). As a rule, it [illegible] from air except by [illegible] only then if the observer is acquainted with all the details of the patient's treatment subsequent to his accident.

Civilian cases rarely present any difficulties, for most patients receive efficient treatment. If any considerable quantity of gas is observed 2 or 3 days after injury, there is a strong probability that the gas is due to secondary anaerobic infection. Battle casualties present much more difficult problems. In our recent series, about a third of all cases which had been injured 2 or 3 days previously had gas in the tissues. I believe that in most cases this gas was air, for it quickly disappeared as soon as the wound was cleansed and the part immobilised. Nearly all these men were remarkably ill on admission and most of them did very well without further surgical intervention, but in a few cases the [illegible]

form in a hæmatoma, around a foreign body or in dead tissue. In such cases there may be no clinical signs of infection and the radiographic signs do not in themselves demand surgical intervention (fig. 4).

It is very difficult to decide when gas-forming organisms have begun to invade the loose cellular tissues. The fact that the wound is dirty, inflamed, [illegible] y reaction is [illegible] ow which o[illegible] ackling in the subcutaneous tissues, or can be seen bubbling from the depths of the wound, this does not mean that the gas is necessarily due to gas-forming organisms, for it may be air. Even the presence of anaerobic bacteria means nothing beyond the fact that the wound is infected, and many wounds so infected show no trace of gas. The only confirmed cases of spreading anaerobic cellulitis I have seen were not associated with any general toxæmia and showed only slight local signs of inflammation. Anaerobic cellulitis almost always accompanies tr[illegible] formation in the loose cellular [illegible] radiographically in advance [illegible] les, whereas clinically there is often but little indication of its presence except when the gas is subcutaneous.

TRUE GAS-GANGRENE

True gas-gangrene is a progressive infiltration of muscle and the loose cellular tissues with gas-forming organisms. As the infection spreads through living tissues, there develops a severe toxæmia, which if allowed to continue brings about the death of the patient.

In our recent series of battle casualties we have records of 7 cases. The radiographic appearances of these 7 cases were similar and quite distinctive, but clinically it was possible to divide them into two groups.

Group 1.—This comprises 2 cases of acute fulminating infection of living tissues. In both these cases the vascular supply to the part was not seriously impaired, the development of the infection was extremely rapid, the toxæmia was profound, and within a few hours of recognition of the disease the patients were dead. The histories of these cases are as follows.

CASE 1.—Bombadier, aged 32 years. July 3, 1944: Injured at 7.10 PM in right arm, right chest, and spine, producing paraplegia; also gunshot wound of back, involving abdomen and spine; given blood-transfusion and sulphanilamide.

July 4: *Operation:* toilet to wounds; entrance and exit wounds of the right arm anteriorly through biceps and coraco-brachialis.

July 5: Admitted to military hospital in England; given sulphathiazole 2 g. followed by 1 g. hourly with fluids; T 102·2° F, P 116, R 22 per min.

July 6: Two necrotic wounds in right arm dressed with sulphathiazole powder; T 103·4° F, P 130.

July 7: Condition much worse; T fell from 101° to 97° F and pulse-rate rose from 120 to 135; severe pain in right arm, which was extremely swollen and tender in both upper [illegible]

At 9.30 AM given penicillin 20,000 units intramuscularly, to be repeated two-hourly. At 11.30 AM given 45,000 units anti-gas-gang[illegible] of hand now [illegible] forearm; h[illegible] (fig. 5) showed gas infiltration of some of the muscles of the arm and forearm. Swab from wounds: gram-positive bacilli, with spores. At 12.30 PM given 90,000 units AGGS intramuscularly. At 2.30 PM patient died.

Autopsy confirmed the clinical findings. Detailed bacteriological studies are not complete.

CASE 2.—Corporal, aged 40 years. At midnight on July 17–18, 1944, sustained a shrapnel wound in his back. Dressed at casualty clearing station and evacuated by air.

July 18: Admitted to the Radcliffe Infirmary. X ray disclosed large foreign body in dorsal region lying in paravertebral muscles on the left side. T 100° F, P 100, R 20 [illegible] receiving sulphanilamide by mouth 6 g. daily.

July 20: Foreign body localised with the aid of fluorescent screen. T 98° F, P 70, R 20. *Operation:* deep collection of greyish pus found around the foreign body which was removed; no signs of gas; bleeding points controlled; sulphanilamide powder introduced; drainage-tube inserted.

July 21: Pain in back below operation region; well-marked pitting œdema of whole back; T 97° F, P 110. X ray of chest advised to exclude pulmonary complication. At 12 noon referred to X-ray department. At this time he was pale, sweating, and in pain; there was considerable œdema of the back, where the muscles were extremely tender and hard.

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* I am indebted to Major H. Davies for the radiograms of this case.

A diagnosis of gas-gangrene was made and radiograms (fig. 6) were taken of the muscles of his back. These showed pronounced pectination of the muscles of the erector spinæ group on the left side. Patient's condition on return to ward fair. He continued to take drinks and hold a rational conversation. Given 22·5 c.cm. polyvalent AGGS intravenously. At 4 PM he suddenly became distressed and at 5 PM he died.

Comment on group 1.—In both these cases of fulminating gas-gangrene the condition was first recognised 6 hours before death. In both the first and only radiographic examination showed that the disease was far advanced. It would have been possible to make an earlier diagnosis by means of X rays many hours or even days previously.

Group 2.—These patients had all sustained severe damage to the blood-supply of a limb. Anaerobic bacterial infection occurred in the infarcted muscles. Clinically, 1 patient was desperately ill on admission, 2 others had some slight toxæmia, and the other 2 developed the infection while the surgeon was awaiting a line of demarcation before amputating for simple gangrene of the extremities.

CASE 3.—Rifleman, aged 21 years. June 26, 1944: Mortar wounds of left leg and left wrist. When he was first seen he was severely shocked. Evacuated to CCS, where he was found to have a penetrating wound just above flexure of left knee and a through-and-through wound of calf; the left foot was cold and no dorsalis pedis pulsation was detected.

June 28: *Operation*: wounds excised; hæmatoma evacuated from left leg; given 40,000 units AGGS intravenously and 5 c.cm. of penicillin solution (strength not stated) intramuscularly; no damage to tibial vessels detected; blood-transfusion given; evacuated by air ambulance.

June 29: Admitted to Radcliffe Infirmary. Some pain in left calf; left leg and foot cold and blue; no pulsation in dorsalis pedis and peripheral vessels detected. His wounds were smelling, and there was no plaster or splint on the leg. T 97° F, P 120. Seen by Mr. Max Page, who pointed out the characteristic earthy odour; the cold dead appearance of the foot and the toxic condition of the patient. He considered that the picture was typical of anaerobic infection and that the leg required amputation. Crepitations could be felt in the muscles of the calf and in the thigh. The thigh was tense and tender. *Operation*: Leg amputated 2 in. above femoral condyles and vessels ligated; sulphonamide powder introduced; penicillin therapy begun.

For 24 hours after operation the patient's condition was very poor and it was feared he would die, but in the next 12 hours he recovered.

Bacteriology: *Staph. albus* and *Cl. welchii* isolated.

Comment.—The infection in this case was secondary to vascular ischæmia of the limb. The man was admitted to hospital 3 days after he had sustained his wound and by this time his condition was critical.

CASE 4.—July 12, 1944: Gunshot wound of left popliteal region with compound fracture of left femur and severed popliteal vessels. At 3.50 AM, exploration of wound at No. 52 Forward Surgical Unit; popliteal artery and vein found to be severed and sciatic nerve bruised but not cut; ligation of vessels; wound toilet; Tobruk plaster. On admission to a General Hospital, complained of pain in leg; toes cold and somewhat swollen, but plaster did not seem tight.

July 13: Surgeon thought toes were becoming gangrenous, probably due to vascular involvement, but advised evacuation to be proceeded with. Penicillin 150,000 units given intramuscularly between July 12 and 13.

July 14: Admitted to Radcliffe Infirmary. T 103° F, P 130, R 25 per min. Patient toxic, complaining of pain in leg; anterior half of foot white, cold, and anæsthetic; could not move toes; blood-pressure 130/60 mm. Hg. Radiograms taken on admission showed fracture of lower end of femur. Soft tissues obscured by plaster.

July 15: At 3 AM plaster removed; thigh not swollen or tender; X ray (fig. 7) showed pectinate appearance of calf muscles and gas in loose cellular planes of thigh. Diagnosis: gas-gangrene. Amputation above knee performed, to eradicate principal source of toxins. Condition after operation very poor; blood-pressure 60/30 mm. Hg. Given a blood-transfusion and penicillin therapy continued. Given 43 c.cm. of polyvalent AGGS in 24 hours.

July 16: Patient's condition had steadily improved. Amputation wound sutured. Gas in the thigh had disappeared. Penicillin discontinued.

No bacteriological findings are available. Unfortunately the leg was not examined after amputation.

Comment.—The radiographic appearances in this case were almost identical with those of case 3, but, *clinically*, the patient's toxæmia was not so serious, probably because the infection had not spread so far into the living tissues.

CASE 5.—Private, aged 18 years. July 18, 1944: Wounded at 10.30 AM; compound fracture of left femur; perforation wound of left thigh; left leg cold and pulseless; large hæmatoma of thigh. *Operation* at No. 16 CCS. Exploration of wound on inner side; femoral artery and vein found divided in Hunter's canal; both ligatured. Exploration of outer wound; compound fracture of lower third of femur with a lot of bits, which were removed; much muscle destruction; strong smell. Debridement; sulphanilamide powder inserted and Thomas splint applied; 20,000 units AGGS given and penicillin drip started. Later, leg was still pulseless and devitalised. Note: "Will require amputation." For immediate air evacuation.

July 19: Admitted to Radcliffe Infirmary: T 99·5° F, P 135, R 25 per min. Left lower leg cold, discoloured, pulseless, and necrotic. Some discomfort in thigh but no definite pain. Crepitations in thigh just above knee-joint. X rays (fig. 8) showed gas infiltration involving anterior crural group of muscles. *Operation*: Wound was smelling typically of gas-gangrene. Leg amputated from middle of thigh. Plasma drip set up and 27,000 units AGGS given into the drip; given 20,000 units penicillin daily.

July 24: Since operation patient's general condition had progressively improved. Temperature had been normal for 3 days. Pulse-rate dropping. Penicillin therapy stopped. Amputation stump dressed; felt normal and looked healthy; no pus.

Examination of the amputated limb confirmed the clinical and radiographic findings. *No bacteriological findings are available.*

Comment.—Localised gas-gangrene involving part of the anterior crural group of muscles. It is probable that the affected muscles had been partly deprived of their blood-supply.

CASE 6.—Private, aged 20 years. July 8, 1944: Compound fracture of right humerus. When seen at No. 36 Forward Transfusion Unit he was very shocked; given 4 pints blood and 84,000 units penicillin. Seen at No. 56 Forward Surgical Unit at 2.30 PM; given AGGS, 22,500 units; blood drip

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Legends to Illustrations

MR. PRICE THOMAS, DR. CLELAND

Figs. 1 and 2—Loculated clotted hæmothorax. Fig. 1: before decortication. Fig. 2: 10 days after evacuation of clot and decortication with simple drainage, showing residual lateral pockets with much pleural thickening.

Figs. 3 and 4—Massive clotted hæmothorax. Fig. 3: before operation. Fig. 4: 5 days after evacuation of clot and decortication with suction drainage, showing full re-expansion of lung and very slight pleural thickening.

Figs. 5–8—Massive clotted hæmopneumothorax with whole lung adherent to basal part of chest. Fig. 5: before operation. Fig. 6: 24 hours after decortication, lower tube sealed off by expanding lower lobe leaving residual fluid, above which the edge of the unexpanded upper lobe can be seen. Fig. 7: 48 hours after operation and 12 hours after the institution of suction; lung now fully expanded. Fig 8: 10 days after operation, showing rapid absorption of fibrinous exudate.

Figs. 9–11—Massive clotted hæmothorax Fig 9 shows total empyema and atelectatic lung after evacuation of clot in June, 1940 Fig. 10 shows appearances in 1942 with gross pleural thickening and mediastinal displacement. Fig. 11: bronchogram in October, 1943, showing small size of lung and the extent of the pleural thickening. This man still has a small residual empyema nearly 5 years after injury.

Figs. 12 and 13—Massive infected clotted hæmothorax. Fig 12 shows dense opacity at base with some pocketing at apex; aspirated fluid contained *B. proteus*, coliform organisms, and streptococci. Fig 13: 21 days after evacuation of clot and decortication with suction drainage, showing full expansion of lung with some residual thickening.

Figs. 14–16—Large closed *Staph. aureus* empyema Fig. 14 shows abscess containing rib fragment in dorsal area of lower lobe; upper lobe adherent to pericardium; fluid level at base with bullet lying in costophrenic sulcus. Fig. 15: 24 hours after decortication with suture of lung abscess, lung aerated and half expanded. Fig. 16: 5 days after operation, upper lobe fully expanded; fluid level at base with no separation of upper lobe from chest wall. Abscess in dorsal area of lower lobe smaller. Subsequently the pleural fluid and air were completely absorbed and the lung abscess disappeared. Bronchography at a later date showed a dilated dorsal branch of the lower lobe bronchus, complete expansion of the lung and minimal pleural thickening. Clinically the patient was fit for discharge 4 weeks after operation.

Figs. 17–19—Total drained empyema following infected hæmothorax. Fig. 17 shows lung aerated but poorly expanded; both visceral and parietal pleura already much thickened. With suction this lung expanded slightly, and could be approximated to the chest wall with much mediastinal displacement; no fusion occurred after maintaining apposition for 9 days. Fig. 18: 48 hours after decortication with suction, lung fully expanded; no mediastinal displacement. Fig. 19: 6 weeks after operation, now fit for discharge; moderate residual pleural thickening with fully expanded lung.

MR THOMAS, DR CLELAND: DECORTICATION IN CLOTTED AND INFECTED HÆMOTHORACES

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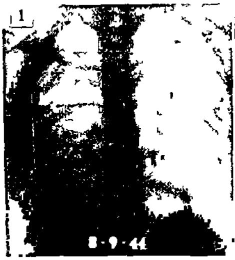

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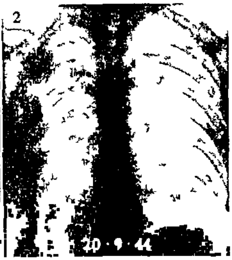

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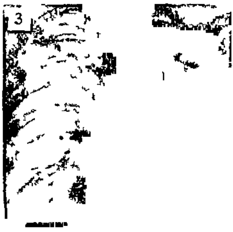
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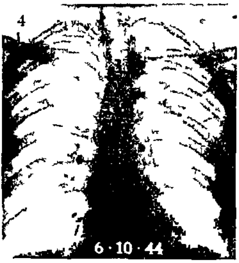

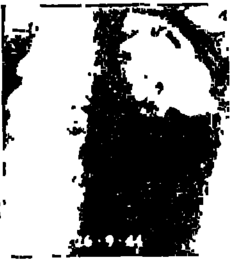

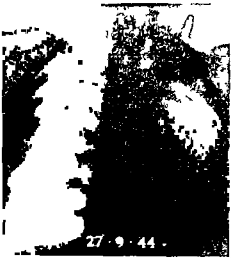

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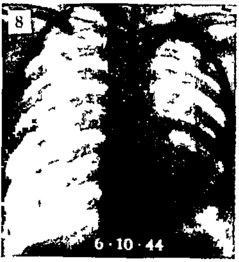

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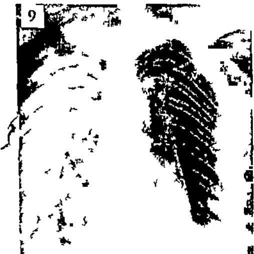
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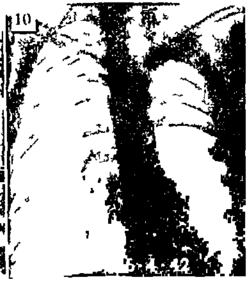

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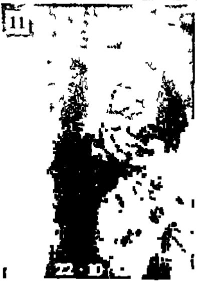

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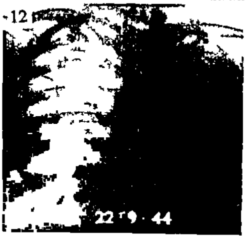

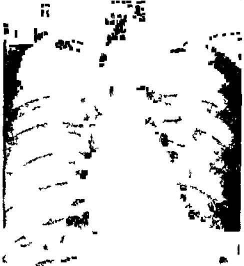
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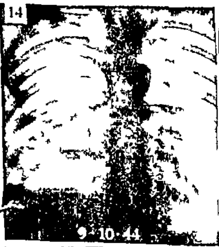

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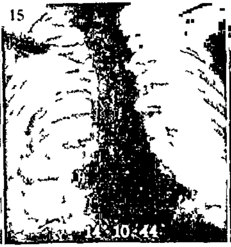

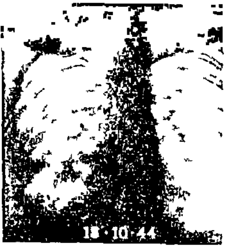

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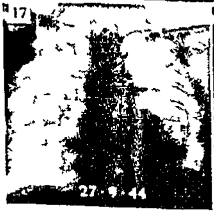

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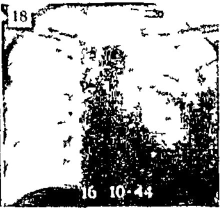

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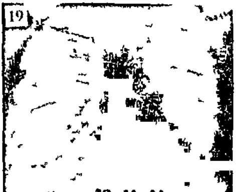
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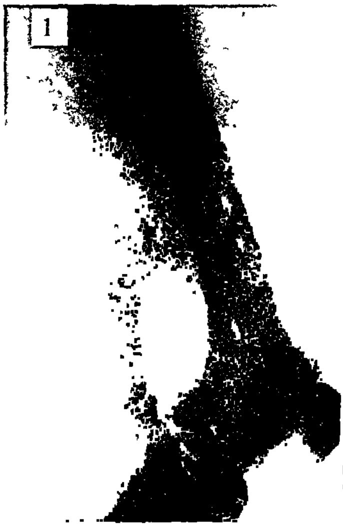
DR. KEMP: X RAYS IN DIAGNOSIS AND LOCALISATION OF GAS-GANGRENE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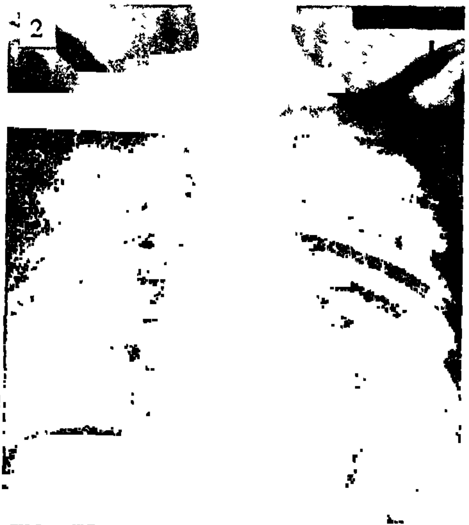
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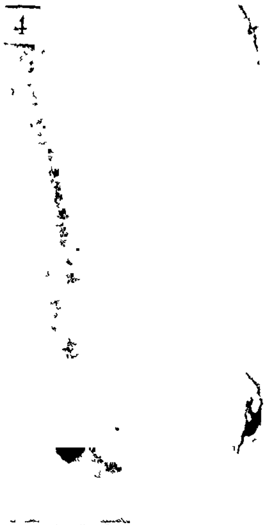
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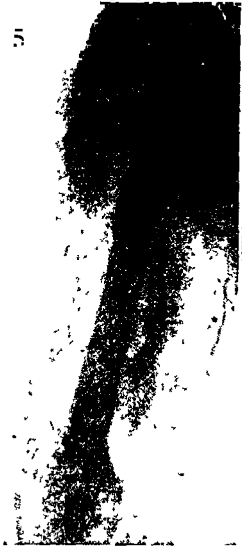
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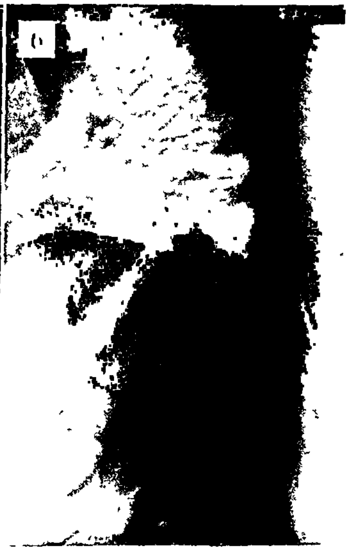
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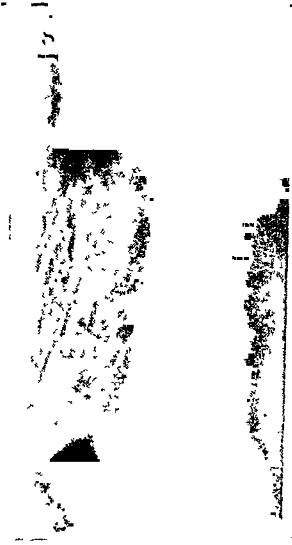
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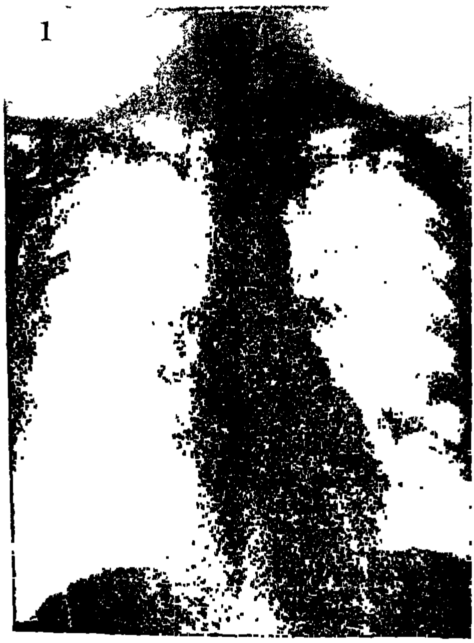
DR. McLAUGHLIN AND OTHERS: IRON OXIDE DUST AND THE LUNGS OF SILVER FINISHERS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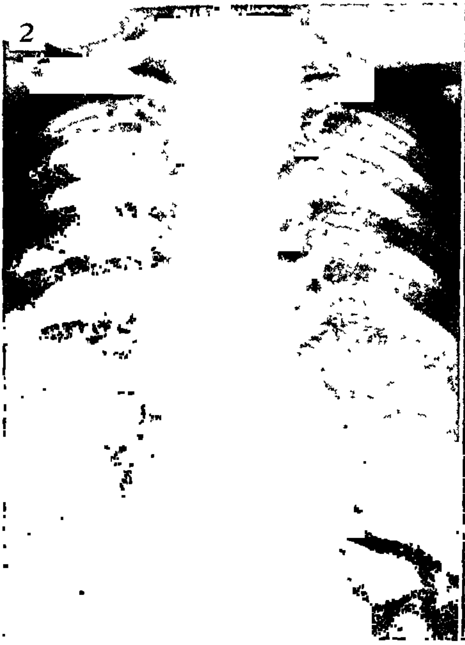
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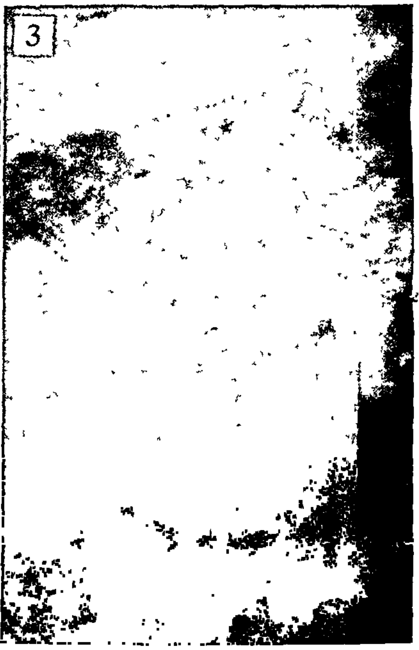
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given in theatre; wounds explored, found to have comminuted fracture of lower third of humerus; forearm cold, blue and pulseless, anæsthetic and paralysed; entry wound on inner side; artery partly severed; radial nerve severed.

July 10: Admitted to Radcliffe Infirmary. Commencing gangrene of the hand; no radial or ulnar pulse; no sensations as high as the mid-forearm; T 98° F, P 90, R 20 per min.; systemic penicillin therapy begun. *Operation:* Two large wounds over elbow-joint. Median nerve and brachial artery found to be cut; wounds cleansed; radius had been fractured; plaster applied. There was no further excision of the wound.

July 21: Over past 10 days the patient's pulse and temperature had been steadily rising. Temperature now 102° F, P 120, R 25. It had been decided to wait for demarcation of the dead forearm, but in view of the patient's general condition operation was decided on. *Operation:* Patient taken to the theatre; plaster removed; X rays taken; pectinate appearance in muscles of forearm; amputation performed a little above middle of arm, a lower amputation [illegible] gangrenous. [illegible]ation of the [illegible]dings.

Comment.—Gas gangrene secondary to vascular ischæmia. Mild toxæmia. Patient had been on penicillin therapy throughout, but in view of the ischæmic condition of the muscles it was unlikely to combat the infection in the dead tissue. After operation the patient made an uneventful recovery.

CASE 7.—*Corporal, aged 22 years.* July 9, 1944: Gunshot wound of both arms at 1.35 PM; compound fractures of both arms. Seen at No. 22 Forward Surgical Unit; general condition very poor; condition of right arm hopeless; left arm pulseless (? brachial artery injury). *Operation* at 6.30 PM; condition very serious; circular amputation of upper third of right arm; toilet to wound on anterior surface of left arm; artery intact (? ulnar nerve injury).

July 10: Muscles of left forearm tense and swollen; no splints or bandages on. Question whether bone fragment was causing injury to the brachial artery; position of arm adjusted, but no improvement; plaster slab applied to arm; for evacuation.

July 14: Admitted to Radcliffe Infirmary; T 100° F, P 95, R 20.

July 15: General penicillin therapy started.

July 19: Temperature had remained high since admission; P 90; had been given continuous drip transfusion. *Operation:* Excision of deep fascia of forearm made on account of swelling.

July 20: Hand warm; no signs of gangrene; X rays showed local gas near the compound fracture of humerus; no signs of gas-gangrene.

July 22: T 100° F, P about 110; hand warm; no visible signs [illegible] gangrene. X rays (Fig. 9) showed considerable gas in the a[illegible]rior muscles of forearm. *Operation:* Mr. Page tried to c[illegible]rve the forearm by excision of the gangrenous radial grou[illegible] muscles, but it proved impossible to eradicate the who[illegible] the injured tissue. Amputation carried out at the junction of the mid and proximal thirds of the forearm. All damaged muscle excised.

July 25: T 100° F, P 110. Patient still looked very pale but was very well considering the severity of his injuries; was still being given penicillin and sulphathiazole.

Aug. 10: [illegible]

Aug. 29: [illegible]

Bacteriol[illegible]

Comment.—Gas-gangrene secondary to primary vascular ischæmia.

Comment on group 2.—The radiographic findings in this group bear no strict relationship to the degree of toxæmia. In cases 3 and 4 the radiographic pictures were almost identical and the distribution of the gas was similar, yet case 3 w[illegible] was only slightly toxic. [illegible] explanation for these find[illegible] had spread from the dead to the living tissues and toxic absorption could readily take place, whereas in case 4 the infection was still practically confined to the dead tissue and toxic absorption was minimal. Cases 4 and 5 required amputation of the limb because part of it was already dead; the anaerobic infection of the muscles in these cases would have been important if operation had been delayed and the infection had spread to the living tissues. Cases 6 and 7 illustrated the importance of repeated examinations of a dead limb while waiting for a line of demarcation; in both these cases the development of anaerobic infection in the dead tissues precipitated operation, for both these patients were beginning to show signs of toxæmia.

DIFFERENTIATION BETWEEN GAS IN TISSUES AND LOCAL EXTRAVASATIONS OF FREE FAT

Anyone who studies soft tissue X rays of the injured must be aware of the normal relative translucencies between the main groups of muscles; these are due to fat. In some cases, especially in old or middle-aged people with flabby muscles, the radiograms show multiple linear streaks in the muscles which are due to fatty replacement; this picture at first sight may resemble the appearance of acute fulminating gas-gangrene, but if care is taken to examine the whole limb the observer will notice that the change is not confined to any one group of muscles and bears no relationship to the clinical signs. In a difficult case a radiogram of the opposite side will help by showing the same appearances.

It is not widely known that after injury there are often local collections of free fat in the loose cellular spaces around the injured part. This fat is revealed as radiotranslucent patches or streaks in the tissues. As a rule the translucency is not so great as that produced by gas, but at times it is difficult to detect a difference. [illegible]ular [illegible]ome [illegible] air disappears quickly whereas fat may persist for several days. If there is a fatty accumulation in a joint—i.e., a lipohæmarthrosis—the fat tends to rise to the surface to form a top layer and a lateral radiogram taken from the side shows a fluid level; t[illegible] in the joint. In fat people, e[illegible] the buttock, radiography may r[illegible] in a bruised muscle which are due to fat; these appearances resemble the earliest stages of gas infiltration of a muscle and cannot be distinguished at a single radiographic examination.

CLINICAL APPLICATION OF FINDINGS

No-one should despise the information which can be obtained from a radiological examination of the distribution of gas in a wound and the surrounding tissues. A better understanding between surgeon and radiologist might help to solve some of the problems of wound surgery.

Every surgeon knows that he cannot hope to eradicate infection from a wound by excising devitalised tissues and cleansing the ca[illegible]en believe that this is [illegible]nd under strict aseptic [illegible]lies seem to prove that t[illegible]ere sound practice, for t[illegible] of injury, foreign matter is drawn into the tissues to places

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Legends to Illustrations

DR. KEMP

Fig. [illegible] in the tissues. Bubbles of air in popliteal space. The original film sh[illegible]many other bubbles and streaks extending as high as the hip region.

Fig. 2 [illegible]cular wound communicating with the thorax. Note air in the left pec[illegible] muscle. Picture simulating gas-gangrene.

Fig. 3[illegible]al gas formation in a wound of the thigh. (Identical appearances can[illegible]ven by air.)

Fig. [illegible]al gas formation in the knee-joint. A film 24 hours previously sh[illegible]o gas. Patient given continuous penicillin therapy. Next day the pat[illegible]as much better. All gas had disappeared. Clinically the infection re[illegible]

Fig. 5—Gas-gangrene. Case 1: Infiltration of the muscles and subcutaneous tissues with gas.

Fig. 6—Gas-gangrene. Case 2: Infiltration of the left paravertebral muscles with gas.

Fig. 7—Gas-gangrene. Case 4: Infiltration of the muscles and subcutaneous tissues with gas.

Fig. 8—Case 5: Localised gas-gangrene affecting the anterior crural muscles.

Fig. 9—Case 7: Gas formation in necrotic muscle. Note "ghost shadows" of the muscle fasciculi. The infection developed 13 days after the injury.

DR. MCLAUGHLIN AND OTHERS

Fig. 1—Chest of case 4, 1936.

Fig. 2—Chest of case 1, 1938.

Fig. 3—Lung texture shown full size.

far distant from the wound track. Air is foreign matter, and unless it is in some way filtered by passage through the tissues it must carry organisms far beyond the reach of even the most radical surgical toilet. The fact that no harm results from the more usual surgical procedures only serves to emphasise the amazing resistance of healthy tissues.

For the same reasons we can infer that prompt and efficient immobilisation of an injured part is sensible first-aid, yet this measure is often forgotten if there is no obvious fracture. A recent case illustrates the point.

A stout middle-aged woman sustained a dirty wound in her left buttock. The wound was cleansed, the skin edges sutured, a drain inserted and she was sent home. Twenty-four hours later she was seen again complaining of severe pain in her buttock some distance from the actual wound. There had been practically no discharge from the tube. Her buttock was very tender but not tense. Temperature, pulse, and respirations were normal. Radiograms showed some gas in the muscle planes of the glutei. In view of the clinical features the possibility of early gas-gangrene was considered. Further questioning disclosed that the woman had been walking about. She was put to bed. Twelve hours later there was less gas and the wound was comfortable. She made a complete recovery without any special treatment.

The most important fact which radiology does establish is that the finding of gas in the tissues does not necessarily indicate anaerobic infection of the wound, and that in the majority of cases the gas is really air. These points are easily appreciated if there are no clinical signs of wound infection but easily overlooked if there is any cause for anxiety, more especially in military cases. When a surgeon discloses discoloured and friable muscles in a wound which is 2 or 3 days old it may seem very suspicious to find bubbles of gas, but if there are no signs of invasion of the healthy tissues it is almost certainly safe to do no more than resect the damaged tissues. A doubtful case should be kept under constant clinical observation and repeated radiographic control.

The value of radiology in the detection of local gas formation in a deep hæmatoma, around a non-opaque foreign body or in a joint cavity, is too obvious to call for further comment.

I cannot give a complete estimate of the value of radiology in the diagnosis of gas-gangrene, for I have not seen enough early cases, but I strongly repudiate the suggestion that X rays are valueless. In every case reported in this paper a correct diagnosis was established without delay and it was clear that a positive diagnosis could have been made many hours earlier. Yet I doubt whether it is always possible to recognise the early stages of invasion of the tissues by gas-forming organisms. In the heavier parts of the body it is easy to miss one or many gas bubbles in the tissues in a single anteroposterior projection. To avoid mistakes the greatest care must be taken to examine the patient clinically, and rotate the limb or position the tube so that the suspected part is uppermost. A projection taken from the side is probably the most important. In experiments on a human cadaver, I found that as much as 3 c.cm. of air could not be detected in the muscles of the thigh in a single anteroposterior radiogram, but lateral projections showed bubbles as small as 0·25 c.cm. Even the most numerous examinations do not always bring success unless the examiner takes into account the clinical features. In case 5 I requested the radiographer to take single projections of the thigh, the leg, and the foot. When the films were examined at first sight they seemed to show nothing abnormal, but a more careful examination revealed a little gas in the muscles just at one edge of the film. Clinically this was the site of the suspected infection. A further film showed the changes quite clearly (fig. 8).

The selection of suitable cases for radiographic examination is of the greatest importance. Every new case admitted to the accident service of a hospital should be examined at least once, preferably as soon as possible after admission. The difficulty is to know which cases should be followed up, since it is impossible to examine repeatedly every case which has gas in the tissues, especially where large numbers of cases are concerned. cally, I have made it a rule to re-examine every who complains of increasing local pain or discomfort in the tissues around his wound. As a rule three-hourly examinations are sufficient, but in some instances, where the clinical course changes rapidly, it may be necessary to examine the patient every hour. If a limb is encased in plaster a radiographic examination is useless and the plaster should be removed.

I do not believe that there are any characteristic clinical signs of early gas-gangrene. Many wounded show slight signs of general reaction and a few may be profoundly ill from other causes. The local signs are very difficult to assess. I am in complete agreement with those authorities who maintain that crepitation is not a reliable guide. As a rule crepitations cannot be felt unless there is gas in the subcutaneous tissues and I doubt whether gas crepitations can be felt in the muscles unless the muscles have already disintegrated. There is no reason why any case should not be radiographically examined. The patient will suffer no harm, for he need not be moved or exposed. If the radiographic findings are suspicious the surgeon need do no more than keep the case under observation, but if the local condition does not improve, or grows worse, the examination should be repeated, for serial radiographic examinations offer incontestable evidence of gas formation.

If spreading gas-gangrene is established, the radiologist should secure a complete examination of the entire limb or part affected. Some years ago I saw a reputable surgeon amputate through muscles which I knew from the radiographic appearances were widely infiltrated with gas, without recognising that the infection was present. He was under the impression that he had eradicated the infection, but it was clear that he had not and shortly afterwards the patient died. It is a fact that at operation it may be very difficult to recognise that the muscles are infiltrated with gas. They may look normal and there may be no ordinary crepitation, though it may be possible to recognise a difference in texture when cutting the muscles with a knife.

The surgeon need not necessarily remove all the infected tissues: it is sufficient to remove the infected muscles and use chemotherapeutic measures to overcome any infection which has been left behind in the loose cellular tissues. In our recent series this procedure was successful in cases 3, 4, and 6.

SUMMARY

An account is given of the clinical and radiological features of 331 battle casualties admitted to a hospital in Great Britain. The report deals in detail with the radiographic appearances of air in the tissues, local gas formation, and gas-gangrene, and gives a detail ount of the clinical application of these findings.

I am indebted to Mr. Max Page, surgeon in c the accident service, and to the surgeons of the Radcli hary for their permission to see and examine these case o all the medical officers who contributed to the reco tails of the pathological findings were provided by I . T. Robb-Smith and Dr. W. J. D. Fleming. I sh e to record my appreciation of the staff of the X-ray ent, whose energy and enterprise made the work po

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Lawson Tait Centenary.—Celebrations in conne ion with the centenary of Lawson Tait (1845–99) will be held in Birmingham at the end of June. Tait was the first professor of gynæcology at the then Mason University Colleg , and the Midland Medical Society, the Women's Hospita l, and the university are sponsoring the arrangements.

West End Hospital for Nervous Diseases.—The outpatient department of this hospital is open as usual (with daily clinics excepting Saturday) at Welbeck Stre et, London, W1 (entrance in Marylebone Lane). Inpatients a re at present accommodated at Princess Louise Hospital for Children, Kensington.

IRON OXIDE DUST AND THE LUNGS OF SILVER FINISHERS

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Illustrations (1–3) *on plate*

THE term "siderosis" was applied by Zenker (1866) to what he regarded as a pathological condition of the lungs caused by long-continued inhalation of the dust of iron or iron oxide. The word has usually been taken to mean that iron dust, like the dust of free silica, sets up a fibrotic reaction in the lung tissue. In this paper we hope to show that at least one form of iron dust does not in fact bring about fibrosis of the lungs and that some of the shadows seen in radiographing the chests of workers who inhale iron dust do not represent pathological changes but are caused by aggregations of opaque dust in the lungs.

SILVER FINISHERS AND IRON OXIDE DUST

Silver finishers or polishers *inhale iron oxide dust at* work and 3 such workers were examined clinically and [illegible] for gastric ulcer. The lungs and other organs of this man have been studied histologically, and chemical estimations of iron oxide and silver in the lungs have been made. The question of the opacity of iron oxide to X rays has been further examined by means of sponges soaked in graded suspensions of iron oxide.

Silver polishers use "rouge" or "crocus" for the final polishing of silver and of silver-plated articles. Both substances are composed of iron oxide (Fe_2O_3) in a finely divided form, rouge being made from iron sulphate by a process of calcination, and crocus by refining iron pyrites. These polishing powders are refined to a high degree of purity and are free from acid and grit. Crocus is reddish purple and rouge has the familiar red colour of rust, but the tint can be varied in manufacture by altering the temperature of calcination. Silver articles are polished sometimes by "handing," that is, by rubbing the articles with the thenar eminence of the hand coated with rouge, but more usually by pressing them against a revolving "dolly" made up of many layers of cotton cloth to which a mixture of rouge and water [illegible] Sometimes rouge "compo," [illegible] use in cake form, is applied [illegible] hand is not a dusty process [illegible] thrown from the revolving dollies even when they are under exhaust ventilation.

Formerly the rouge used to be mixed with oil and not so much dust was evolved, but more recently it has become the practice to mix the rouge with water for application to the dollies, and after the water evaporates the rouge dust *is freely liberated into the air of the* workrooms. The reason for the change is that the articles are not as heavily plated as they used to be, and the work can be done more quickly and with the removal of less silver [illegible] with oil-mixed rouge. In a [illegible] iron oxide dust mixed with fl[illegible] settles on the benches, floors and rafters. The fluff and dust also contain a little silver. In the room where the silver finishers [illegible] paper worked, about 14 oz. [illegible] dust each half-year. Silver [illegible] throughout their working [illegible] dust, with less cotton dust, and still less silver.

The first three men (cases 1–3) were asked to attend for examination because they were working as silver finishers and not because they complained of ill health.

CLINICAL AND X-RAY EXAMINATIONS

CASE 1.—A. B., aged 54 in 1936, had been employed as a silver finisher for 40 years and had done no other work. He had had no serious illnesses. His father and 4 brothers had died of "grinder's disease" (? silicosis and/or tuberculosis) and his mother of spinal paralysis. He said that he felt very well but he had had a slight cough for 10 years, and that after a day's work he coughed up copious reddish-black sputum, but he made no complaint of dyspnœa.

Clinical examination showed that his chest was somewhat barrel-shaped, suggesting emphysema. The chest movements were restricted and the percussion note over the whole of the lung fields was moderately hyper-resonant. The breath sounds were distant and no adventitious sounds could be heard. The heart was normal and no abnormalities were noted in the other body systems except that the sclerotics of both eyes were greyish-blue, presumably through staining by silver. No patches of argyria were seen in the skin. The sputum contained numbers of macrophages filled with granules which gave the prussian-blue reaction for iron.

X-ray examination of the chest showed slight peaking at the upper border of the right diaphragm suggesting pleural adhesions there; the heart was normal in size and position and both lung fields showed generalised stippling or reticulation with some increase of linear striation.

The post-mortem and histological appearances of this man's lungs are described below.

CASE 2.—C. D., *aged 34 in 1936, had been a silver finisher* for 20 years and had done no other job. His family history revealed no relevant details and his own health record was good. His only complaint was a slight cough of some years' duration together with copious red-black sputum after a day's work.

Movement was diminished at the left apex *and the percussion* note was normal over the whole of the lung fields. The breath sounds were generally clear and vesicular except that at the left apex the expiratory sound was prolonged and blowing. No adventitious sounds were heard. The other body systems were normal and the sclerotics showed no argyria. The sputum contained macrophages filled with iron oxide granules.

X-ray examination showed that the diaphragms were normal, and that the heart was asthenic in type but situated normally. Over both lung fields there was an increase of linear markings, more pronounced in the upper half of the left lung. Calcified nodes were present at the left hilum. Stippling or reticulation was seen over both lower lung fields, especially at the left base.

CASE 3.—E. F., aged 57 in 1936, had been a silver finisher all his working life (40 years) except for 3 years' Army service during the 1914–18 war. He had had no illnesses during this period and had not been gassed. There was nothing relevant in the family history. His previous health had been good and he had no symptoms except slight cough and red-black *sputum after work.*

He was a well-nourished, rather obese, man, with slight argyria of the eyeballs. No abnormal signs could be detected over the lung fields and nothing abnormal could be found in the heart on ordinary *examination.* The tension of the *pulse was somewhat* raised but unfortunately a sphygmomanometer reading was not taken. There were no clinical signs or symptoms such as dyspnœa, pain on exertion or *œdema to suggest that the heart* was not functioning well. The sputum contained macrophages filled with iron oxide granules.

X-ray examination showed that the diaphragms were normal. The heart shadow was of the "boot-shaped" type with some enlargement of the ventricles. Over the lung *fields there* was some increase of the linear markings especially on the right side. Stippled shadows were present over both *lower lobes. The radiologist's* conclusions before he knew the occupation were as *follows*: "*the shape of the heart* suggests the possibility of hypertension, part of the changes *in the lungs* probably being due to this. There is some fibrosis of the lungs of the type seen in early silicosis."

The fourth man spontaneously *attended the out*-patient department of the Sheffield Royal Hospital complaining of gastric *symptoms of 15 years'* duration.

CASE 4.—G. H., aged 52 in 1938, had worked as a silver finisher for 38 years—i.e., since he was 14. His father and brother had both died recently of pulmonary tuberculosis.

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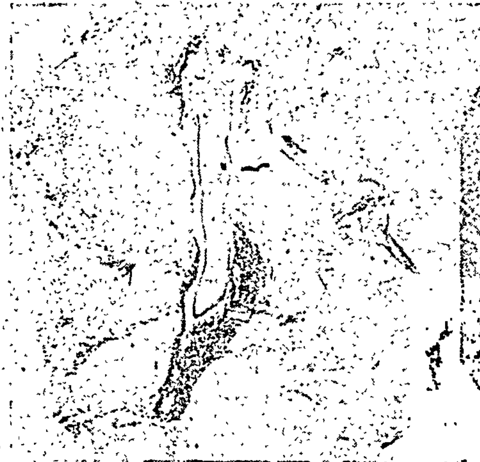

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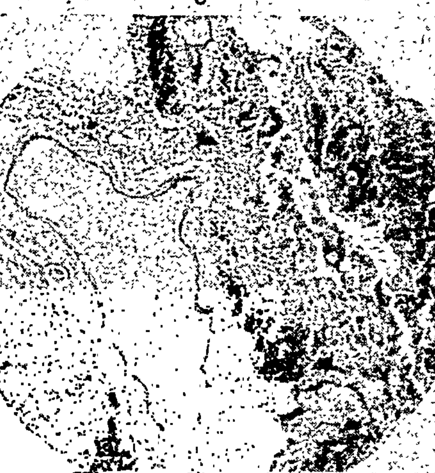

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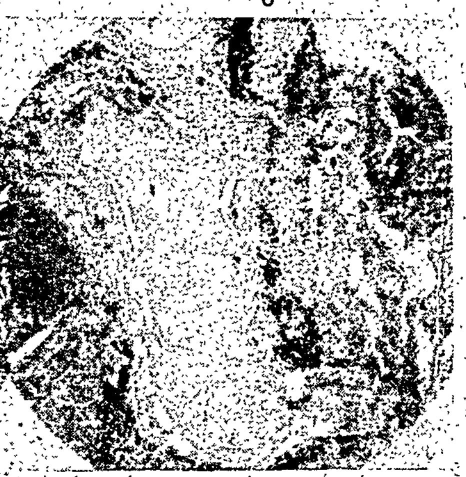

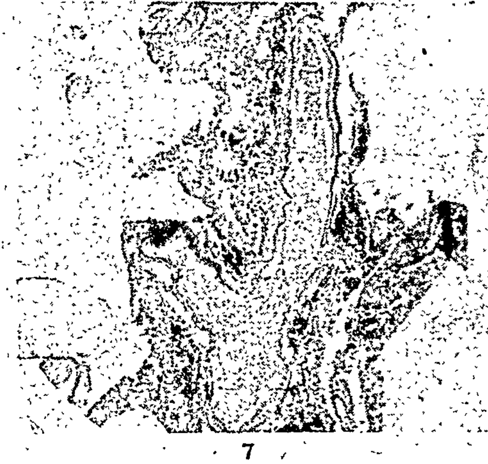

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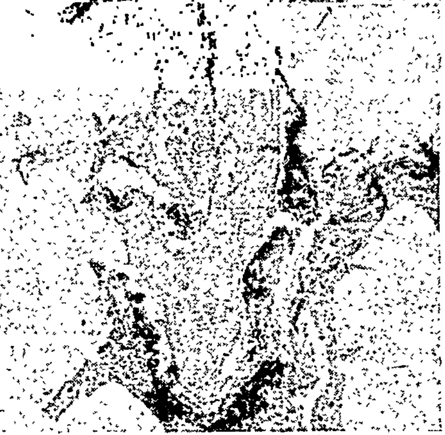

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Fig. 4—Unstained section of lung (× 17) showing aggregate of pigment-containing cells and fine linear pigmentation.

Fig. 5—Section of lung (× 36) stained hæmatoxylin and eosin.

Fig. 6—Duplicate section of fig. 5 treated with KCN before staining. Note loss of pigment in artery wall and alveolar walls.

Figs. 7 & 8—A similar pair to figs. 5 and 6 (× 36).

He had no symptoms or signs pointing to a chest condition but in view of the family history the chest was radiographed (fig. 1). The radiologist found a general fine fibrosis and in both infraclavicular zones "mottling which suggests a Koch's infection. The fibrosis of the lungs is probably related to his occupation." Two months later he reported: "The findings are similar to those previously described, that is, of silicosis." Full investigation of the alimentary system revealed nothing to account for the gastric symptoms, and a final diagnosis of inactive pulmonary tuberculosis was made.

It is noteworthy that in all these 4 cases the X-ray appearances were at first attributed to "early silicosis."

SUBSEQUENT FINDINGS IN CASE 1

On July 3, 1943, 6½ years later, A. B. was admitted to the Sheffield Royal Hospital with a 6 weeks' history of continuous and increasing epigastric pain. He had worked at silver finishing up to 10 days before admission. A diagnosis of gastric ulcer (? malignant) was made and a partial gastrectomy was done. He died on July 28 from peritonitis and bronchopneumonia.

During his stay in hospital clinical examination of the respiratory system revealed few abnormalities until the onset of the terminal bronchopneumonia. The chest was barrel-shaped and a few fine crepitations were heard at both bases. Argyria of the sclerotics was noted. On July 13 the radiologist, who did not then know the man's occupation, nor that he had been radiographed previously, reported that "the whole of both lung fields presents an opaque, finely reticulated appearance often seen in hæmatite workers. The condition is probably occupational in origin" (figs. 2 and 3). Comparison with the film taken 6½ years earlier showed no essential alterations.

Autopsy was performed 23 hours after death.

Extremely dehydrated emaciated edentulous man. Recent strectomy and anterior gastrojejunostomy. Rupture of suture line closing gastric spur. Abscess between transverse colon, liver and abdominal wall localised by fibrinous adhesions. Dilatation of ascending and first part of transverse colon. Collapse of descending colon. General fibrinopurulent peritonitis. 100 c.cm. of thick green pus in pelvic cavity. Moderate soft wet enlargement of abdominal lymph-nodes. Well-marked lobular pattern in liver. Small spleen with dark purple rather friable cut surface.

Rather bulky heavy lungs. Smooth blue-grey pleura except at site of light fibrous adhesions at the right base. Bullous emphysema of anterior borders and generalised spongy emphysema of rest of lungs with uniform grey-black cut surface. Complete rubbery consolidation of a curved shield of lung in the posterior borders of both lower lobes containing scattered pale nodules of frank pus. Thin yellow pus throughout bronchi. Considerable œdema of both upper lobes. No visible fibrosis of lungs. Moderate enlargement (largest 1·8 cm. diameter) of reddish brown hilar and mediastinal nodes. Slight hypertrophy and dilatation of right ventricle (wall 0·3 cm. thick; left ventricle 1·2 cm. thick). The remaining organs appeared normal.

After fixation the pleura was smooth, even, slightly more opaque than normal, and slaty-blue with blotches or small splashes of reddish purple. The cut surface of the lung was a dark brown-black.

On microscopical examination sections of the lung showed extensive acute bronchopneumonia and a fairly well-marked emphysema. There was no evidence of chronic inflammation and in particular *no fibrosis*. No thickening of the walls of the smaller bronchi or of the pulmonary arteries, as described by Boemke (1938), could be found. At least three kinds of pigment were present (fig. 4).

(i) Pigment enclosed in and filling phagocytic cells. A few of these cells were free in alveoli but the majority were found in collections or aggregates under the pleura and alongside pulmonary vessels. These aggregations distended the connective tissue in these areas but there was no good evidence of any increase in the surrounding connective tissue—i.e., there was definitely no increase in collagen fibrils, if there was any increase in reticulum fibrils it was very slight, and the cellular increase was entirely due to phagocytic cells. This pigment which would normally be taken as carbon, appeared opaque and black in transmitted light; it did not show any coloration after treatment with potassium ferrocyanide and hydrochloric acid (neither did the sample of rouge supplied). In incinerated sections it was readily seen by reflected light to be reddish brown; it dissolved with some difficulty but eventually almost entirely in strong acid. Presumably this pigment was iron oxide. It constituted most of the pigment in the lung and was fairly evenly distributed with perhaps rather more in the upper lobes.

(ii) A finely granular pigmentation of the elastic laminæ of the pulmonary arteries and of the elastic fibrils in the alveolar walls. This pigment appeared brownish black by transmitted light. It did not stain with potassium ferrocyanide and hydrochloric acid and attempts to colour it by *p*-dimethylamino-benzal-rhodanine (the spot test reagent for silver) were unsuccessful. In incinerated sections viewed by reflected light these granules were not identifiable with certainty but appeared to be represented by fine shining white lines. Sections which had been treated for some hours with 1/1000 KCN solution were compared with untreated duplicates (figs. 5-9).

This pigment had disappeared while the intracellular aggregates were unaltered. It is unlikely that the treatment would have removed any iron and the cyanide solution after use on several sections gave no reaction with ferrocyanide and HCl. We believe therefore that this pigment is silver, although the distribution is unlike that seen in our other cases of argyria. The latter were however produced by ingestion of silver nitrate many years before death, and not, as in this case, by inhalation of metallic silver continually up to a few weeks before death. Blaschko (1886) described a finely granular precipitate on elastic fibrils in the dermis in the neighbourhood of tiny particles of silver that had been driven through the epidermis of the fingers or hands of silver workers. This was the first demonstration of elastic fibrils in this region. He also noted that the distribution of the silver pigment in this condition differed from that found in the skin in argyria resulting from ingestion of silver nitrate. A good summary of this work and a reproduction of the illustration are given by Heffter and Heubner (1931).

(iii) Iron pigment stainable with ferrocyanide and HCl was present in small amounts in intra alveolar phagocytes.

The only other organs available for section were the liver, spleen, thyroid and hilar lymph-node.

There was moderate central lobular congestion of the *liver* and in sections treated with ferrocyanide and HCl the chief [illegible] anules in [illegible] Rarely [illegible] very few of the Kupffer cells were hypertrophied and stained blue. There was no portal fibrosis and no stainable iron in the portal tracts.

The reticulo-endothelial cells of the *splenic pulp* were closely packed and hypertrophied and contained masses of hæmosiderin. The malpighian bodies contained no pigment. There were some recent interstitial hæmorrhages between the malpighian bodies and pulp.

There were masses of pigment no. 1 in phagocytes in the medulla of a *hilar node*. The sinuses contained abundant phagocytes filled with hæmosiderin and there was a healed focus of tuberculosis whose scar tissue was stained diffusely blue by ferrocyanide and HCl

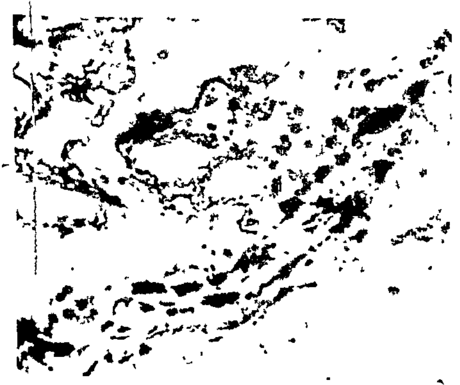

Fig 9—Section of lung (× 450) showing fine dusting with silver in alveolar walls and arterioles contrasting with the dark masses of iron pigment in phagocytes

The large amounts of hæmosiderin in spleen, liver and lymph-nodes we believe to be derived from the rouge. Similar stainable pigment has been noted by several authors (e.g., Langguth 1895, Bohrod 1930) who have found most of the iron pigment in the lungs to be inert to ferrocyanide and HCl. Menkin et al. (1935, 1936) have demonstrated that inorganic iron can be converted in the animal body into a substance indistinguishable from hæmosiderin derived from hæmoglobin.

Chemical examination of the lung showed that ash constituted 10·17% of the dry weight, and of this ash 72% was iron (reckoned as Fe_2O_3) and 6% was silver (as metal). No determination of the silica content was made, but incinerated and acid-treated sections showed only fine traces of doubly refractile material.

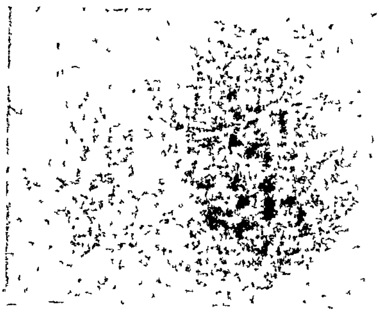

Fig 10—Sponges : *Left*—Radiogram of untreated sponge. *Right*—Radiogram of sponge soaked in suspension of iron oxide.

OPACITY OF IRON OXIDE AND SILVER TO X RAYS

It is well known, at least to radiologists, that metals and their salts placed in the path of X rays will throw shadows, the density of which varies with the atomic weight—i.e., the higher the atomic weight the denser the shadow. Although this fact is known, it has not often been considered in the interpretation of the chest films of workers who inhale radio-opaque dusts. Even when Collis suggested (Fawcitt 1913) to Thurstan Holland that hæmatite dust might be opaque to X rays, the latter, after agreeing that it was, said that he was convinced that the "main part of the shadowing (in the chest films of hæmatite miners) must be due to inflammatory thickening—particles of dust being merely the active cause of this. ..." Another elementary point about X-ray shadows seen in chest films is that the air in the lungs acts as a contrast medium against which the details of the opaque structures are shown up. In other words, if there were no air in the lungs there would be no lung detail seen in chest X-ray films.

Sponges in some respects resemble the lung tissue in that they consist of trabeculæ and air spaces. An X-ray picture of an untreated sponge resembles that of a normal lung. To determine whether iron oxide particles in sponges would throw X-ray shadows comparable with those seen in silver finishers and electric arc welders, we took a series of sponges and X rayed them. Then they were soaked in graded suspensions of iron oxide (ranging from 5 to 60 grains in a pint of water), the excess fluid was squeezed out, and they were again radiographed. Stippled shadows (fig. 10) appeared in the films of the rouge-containing sponges, varying in density with the concentration of iron oxide particles. Similar shadows were seen when sponges soaked in suspensions of French chalk were radiographed.

We have not been able to make similar experiments on the opacity of silver to X rays, but theoretically the shadows thrown by silver particles should be even more dense than those caused by iron oxide particles. The atomic weight of silver is 107·8, whereas that of iron is 56. The ash of the lungs of case 1 has been shown to contain 72% of iron and 6% of silver and it can be argued that at least some of the shadows seen on radiography are due to silver as well as to iron oxide. We think it likely that most of the shadowing is due to iron oxide rather than to silver because iron oxide is in the form of aggregates, whereas the silver is finely and widely distributed along the arteries and the alveolar walls. An aggregate of radio-opaque dust is more likely to throw a shadow than would particles of a more widely dispersed radio-opaque dust, even of a higher atomic weight. It is possible however that the silver particles might be responsible for some of the increase of linear markings of the film. The stippling or reticulation is, in all probability, caused by the aggregates of iron oxide dust.

SHORT REVIEW OF LITERATURE ON SIDEROSIS

The earliest description of siderosis of the lung was published by Zenker in 1866; he described the lungs of a woman who had been employed for 7 years in the preparation of blotting-paper by a now obsolete process of rubbing in powdered dry iron oxide (called "English red"), and also those of a man who had worked for 25 years at polishing mirrors with "English red" which is presumably similar to the rouge used by silver finishers. Cases were then described by Merkel (1869) and by Langguth (1895); the latter's patient had been a miner of red ironstone for 41 years. Three of these early cases certainly had pulmonary tuberculosis and the fourth probably had it; Langguth's case probably had silicosis as well. It is not surprising, therefore, that pulmonary fibrosis was a feature in all these cases although Merkel's showed only minimal amounts (see illustrations in Schmidtmann and Lubarsch 1930).

In 1923 Collis said that "X-ray photography has disclosed the presence of shadows suggestive of fibrosis of the lungs in hæmatite miners but the opacity of oxide of iron to X rays rather detracts from the significance of these findings." Letters passing between Collis and Thurstan Holland in 1919 show that they were even then considering that some X ray opacities in the lungs might be due directly to iron oxide and other dusts (Fawcitt 1943). Experimental work by Carleton (1927), by Haynes (1931) and by Naeslund (1938) showed that inhaled hæmatite dust did not produce any fibrosis of the lungs of guineapigs or rabbits.

Bohrod (1930) summarised the literature on siderosis of the lung and added two not altogether satisfactory fresh cases. Lawson et al. (1931) described a case of fibrosis of the lungs apparently due to silicosis in a iron miner, whilst Stewart and Faulds (1934) in an excellent paper described the siderosilicosis occurring in West Cumberland hæmatite miners. Since then there have been several reports on the lungs of ironstone and hæmatite miners that have added little to our knowledge. Heim de Balsac and Feil (1935, 1939) stated that the X-ray findings in these workers are not infrequently much more evident than their clinical disability. Recently Fawcitt (1943) gave short notes on the history of iron-ore mining and of the clinical features of iron-ore workers; he illustrated the great variability of both the X ray and the clinical findings in workers in the Cumberland mines. There is of course no doubt that some hæmatite miners inhale the dust of free silica as well as iron oxide dust and that they develop silicosis and silico-tuberculosis.

Doig and McLaughlin (1936) were the first to draw attention to the X-ray changes in the lungs of electric arc welders, and suggested that, amongst other possibilities, the iron oxide particles might be opaque to X rays and produce the picture without the presence of pulmonary fibrosis or congestion; but they were unable to obtain post-mortem material to confirm this or their other suggestions.

Brailsford (1938) reported that he had found X-ray appearances of fibrosis in the lungs of most of a group of welders and considered that its cause was either the asbestos covering of the electrodes or the nitrous fumes generated by the arc. Killick (1938) also reported fine mottling in the X-ray films of the chests of 5 arc welders and stated that these had physical disabilities not found in 6 other welders, who had no visible mottling. Pozzi (1938) gave a rather depressing picture of the clinical course of arc welders but no factual data to substantiate his thesis.

Enzer and Sander (1938) examined 26 welders finding X-ray changes in 10 of them who had no symptoms and were apparently healthy; one of these men later died after an accident and they exhumed his embalmed body 16 months after death. This is the only recorded autopsy on an arc welder and it is noteworthy that Enzer and Sander could find no evidence of fibrosis in the lungs either on naked-eye examination or in histological sections, despite much pigmentation.

Britton and Walsh (1940) reviewed the literature on welders' lungs and reported the results of examination of 286 welders, all of whom had been exposed to the fumes for more than 5 years. They concluded that "changes in the chest films after many years' exposure to welding fumes may occur. These changes are not accompanied by disability." Harrold et al. (1940) exposed large numbers of animals to electric arc fumes, finding siderosis but no fibrotic changes or other lesions of a permanent nature ascribable to metallic fumes. Koelsch (1941) examined 40 welders and reported considerable X-ray changes in one of them. Nayer (1942) reported a case of a welder who showed multiple linear and nodular densities on radiography of the lungs and who also had an inflammatory lesion of the bronchus. Gardner and McCrum (1942) radiographed the lungs of 3 guineapigs that had been exposed to arc welding fumes for a long period and found that they could distinguish these from films of a normal animal's lungs, since the great number of fine particles of high molecular weight caused a diffuse shadow which gave the lung fields a very fine grainy appearance.

To the best of our knowledge no description of siderosis in a silver finisher or polisher has previously been published. The cases whose occupation and conditions of work most nearly approach those described in this paper are the earliest recorded examples of siderosis (Zenker) and the mirror polisher described by Boemke (1939). In all these it appears that the siderosis was due to rouge which may well have been impure.

DISCUSSION

X-ray examination of the chests of four silver finishers revealed the presence of stippled or reticulated shadows in each case, the picture resembling that found in welders, in hæmatite miners, and in other workers who inhale iron and iron oxide dust. The X-ray appearances of the lungs of electric arc welders were described by Doig and McLaughlin (1936) as a fine "stippling" and in some cases "nodulation" distributed more or less evenly over both lung fields. The X-ray picture is comparable in many respects with that later described by Hart and Aslett (1942) as "reticulation" in their studies of Welsh coalminers. In these miners it was found that the X-ray reticulation when correlated with the histological changes (Belt and Ferris 1942) was due to fibrosis and not to the presence of dust as such. In silver finishers and in welders the individual shadows appear to be related in size and distribution to the aggregates of iron oxide dust found in the peribronchial and periarterial lymph spaces. The density of the shadows is apparently proportional to the amount of iron oxide dust present and also to the atomic weight of iron. Cases of baritosis (Pendergrass 1938, and Preti and Talini 1938) caused by the inhalation of the dust of barytes and barium salts have somewhat denser shadows of a similar distribution in the chest films because the atomic weight of barium (137·4) is much higher than that of iron (56). In cases of both siderosis and baritosis there is little evidence that the presence of the dust per se in the lungs causes much if any disability, and certainly pure iron oxide does not set up a fibrotic reaction in the lung tissue. Admittedly the silver finisher who came to autopsy had emphysema of the lungs but it is not certain whether this condition was related to his occupation. Other radio-opaque dusts—e.g., French chalk, when inhaled into the lungs produce similar X-ray shadows with no apparent disability (Merewether 1934).

By contrast the X-ray shadows seen in cases of silicosis are in the main not due to the presence of opaque dust (atomic weight, of silicon is 28), but probably to the amount of fibrotic tissue and congestion present in the lungs. We know of some cases in which there was fairly well-marked silicosis at autopsy but in which radiograms were normal during life. The shadows in silicosis become more dense as the lesions become older and particularly if calcium salts (atomic weight of calcium is 40·1) are deposited in them.

The X-ray changes seen in the early stages of pneumoconiosis of Welsh coalminers are called "reticulation" by Hart and Aslett (1942) and are regarded by them as a radiographic entity with an anatomical individuality. This is termed "dust reticulation" by Belt and Ferris (1942) and likened to innumerable small dust-ridden cobwebs linked up with each other. "They represent traps where dust-laden phagocytes have been brought to rest and transformed into fixed tissue phagocytes which then become knit together into a meshwork by the elaboration of reticulum fibres. These fibrils are argentophil ... and the condition is actually a form of fibrosis." In our silver finisher there are comparable X-ray changes and a similar anatomical distribution of dust and phagocytes, but no increase of reticular tissue.

It appears that when studying the X-ray appearances of "dusty lungs" or of the pneumoconioses two factors have to be taken into account: (1) the radio-opacity of the inhaled dust, and (2) the capacity of the dust to set up fibrotic or other pathological changes in the lungs —i.e., whether it is active or inert. Iron oxide in its pure form appears to be inert, but it is opaque to X rays. The X-ray appearances set up by an inert dust cannot be distinguished on the radiological evidence alone from the early changes caused by an active non-opaque dust. Finally the term "siderosis" has carried with it an implication that iron or its oxides causes fibrosis of the lungs; we think that a clear distinction should be made between siderosis and sidero-fibrosis.

SUMMARY

1. The results of the clinical and radiological examinations of 4 silver finishers who inhale the dusts of iron [illegible] In one case the gross [illegible] and chemical analyses [illegible]

[illegible] X-ray shadows of the lungs of these workers are cast by aggregations of iron oxide dust, opaque to X rays, in the peribronchial and periarterial lymph spaces. The presence of silver particles in the lungs does not materially affect this interpretation of the X-ray shadows.

3. No fibrotic changes (either collagenous or reticular) are set up in the lungs by the inhaled dust which consists mainly of pure iron oxide (rouge).

4. Little or no physical disability appears to be caused by the presence of iron oxide dust in the lungs, though in one case there was emphysema.

5. The particles of silver inhaled continually over 40 years produced intra-vitam staining of the elastic tissue in the arterial and alveolar walls. In 2 cases there was slight argyria of the sclerotics but in none of our 4 cases was the skin stained with silver.

6. In the interpretation of the X-ray films of the chests of workers in dusty occupations, consideration should be given both to the activity of the dusts in producing pathological changes and to the opacity of the dusts to X rays.

7. A worker who has inhaled radio-opaque dusts may have an X-ray picture of the lungs simulating early silicosis, miliary tuberculosis or other pathological condition and yet have no obvious physical disability.

Dr. E. Fretson Skinner and Dr. C. Gray Imrie kindly allowed us to report cases 1 and 4, and Dr. John Pemberton made the pathological investigation possible by remembering that case 1 had been radiographed 6½ years before admission to hospital.

We are also indebted to Mr. A. W. Collins for the photomicrographs (figs. 3–7) and to Dr. A. F. Foster-Carter and Dr. Kenneth Perry for fig. 8.

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MITE-BORNE TYPHUS IN THE ANGLO-EGYPTIAN SUDAN

R. W. STEPHENSON, M R C S
SUDAN MEDICAL SERVICE

THE following case of mite-borne or "K" typhus is the first of this type to be recorded in Africa, and its clinical course differed in some respects from the typical Japanese river fever.

CASE-HISTORY

An English woman, aged 39, left England in 1938 and was in the Union of South Africa until she came with her husband to the Sudan. They travelled overland, arriving at their station, Abu Usher, on [illegible] no illness since [illegible] October. For 3 [illegible] not been away from Abu Usher, which is 70 miles south of Khartoum, in the northern part of the gezira irrigated area, the great cotton-growing area of the Sudan. The common diseases here are relapsing fever, malaria, and bilharziasis. No case of clinical typhus [illegible] gezira, [illegible] on the [illegible] case [illegible] OXK, and OX2).

From about Oct. 7, 1943, the patient complained of headache of gradually increasing severity. It tended to come on in the afternoon and evening and could be relieved for a few hours by aspirin. The temperature was not recorded during this period but there was probably slight pyrexia. On Oct. 14 a papular rash appeared and the temperature was 99·2° F at 6 PM. The patient did not take to her bed until Oct. 16 when her afternoon temperature was 101° F. Headache was by this time severe, with pain in neck and shoulders like a stiff neck. Severe pain on movement of eyes, and congestion of conjunctivæ. There was pronounced depression. There was no glandular enlargement and the spleen could not be felt. Urine normal. I diagnosed her clinically as a case of typhus, [illegible] physician of the Khartoum [illegible] inion. We have both had [illegible]

During the next six days her condition got worse. The temperature rose to 103° F, being a degree or so lower in the mornings than in the afternoons. Headache was severe and intractable. Patient had, in the past, suffered from occasional severe attacks of migraine, but described the headache as being much worse than any she had experienced in these attacks. There was severe prostration, and insomnia. Later she was largely amnesic for this period. On Oct. 23 there was slight improvement, continued until Oct. 27 when the temperature became normal and showed no further rise. Convalescence thereafter was uninterrupted but slow.

Rash.—The rash appeared as a few papules on the abdomen and back on Oct. 14. By Oct. 16 these had increased considerably in number. No rash ever appeared on arms, legs, neck, or face. No primary eschar was discovered, but it is possible that this was missed since she was suffering badly from sandfly bites on the legs at the time. On Oct. 18 the rash began to fade, and by Oct. 21 there was only apparent a faint subcuticular mottling on the back, and some general discoloration of the abdomen which lasted for about ten days longer.

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Laboratory investigations.—No malaria parasites were found in blood slides examined on several occasions. Specimens of blood and fæces were sent to the Stack Medical Research Laboratories on Oct. 18; reports were as follows:

Blood-culture, sterile.

Widal reaction.—The standard procedure in the Stack Laboratories is to use living suspensions of 18-hour broth cultures in all cases. The cultures are diluted to 450 millions per c.cm. as in the standard Dreyer's technique. The tubes are incubated in a water-bath for 4 hours at 52° C, then removed and left on the bench till next morning (18 hours), when the readings are recorded. Blood from cases of epidemic (louse-borne) typhus imported from Egypt has given consistently positive agglutination tests with OX 19 and negative with OXK and OX 2. In the present case the results were: Typhoid "H" 1 in 500; typhoid "O" 1 in 50; para A, para B, and melitensis negative. The high "H" titre was in all probability due to a recent TAB endotoxoid inoculation and hence of no significance.

Weil-Felix reaction.—HX2, 1 in 50; OX2, negative; OX19, 1 in 50; OXK, 1 in 2500.

Fæces: no pathogenic organism isolated.

Urine: sterile.

COMMENT

The clinical features and laboratory findings leave little doubt that the case was one of the typhus group.

The high OXK agglutination titre is usually regarded as characteristic of the Far Eastern subgroup of rickettsial infections transmitted by mites, but this subgroup appears to be unknown in Africa. The possibility remains that the case was an atypical infection of one of the African endemic types: but with the exception of one probable case of tick typhus reported in the Southern Sudan, Equatoria Province,[1] neither murine (rat-flea-borne) nor tick typhus has ever been encountered in the Sudan. Epidemic typhus (louse-borne), with the exception of a few cases imported from Egypt in 1943 which were confined to the frontier district of Wadi Halfa, is also unknown in the Sudan.

The exact type of infection in this case therefore remains unknown.

Preliminary Communications

TRANSMISSION OF ARSENOTHERAPY JAUNDICE BY BLOOD: FAILURE WITH FÆCES AND NASOPHARYNGEAL WASHINGS

DURING the present war there has been a very high incidence of jaundice associated with arsenotherapy in certain venereal disease clinics in England. Attempts to transmit the disease to animals by inoculation of blood, nasal washings, fæces, and urine have been unsuccessful. In order therefore to obtain information on the ætiology of this condition, blood and fæces from two cases of so-called arsenotherapy jaundice have been inoculated into human volunteers.

Case 1 was a soldier attending a military VD clinic in which formerly there had been a high incidence of jaundice, which, however, had dropped to a low level in the months immediately before the patient became ill. Jaundice developed in this man during the 14th week of his treatment, after 12 injections of neoarsphenamine and 6 of 'Thiostab.' Blood was collected 16 days after his first sign or symptom (which was a punctate erythematous rash), and 24 hours after slight jaundice of the sclerotics had been observed.

The serum from this man, which was Wassermann-negative, was injected subcutaneously in amounts of 0·25–1·0 ml. into ten volunteers (group A), seven of whom developed symptoms after 35–60 days, and jaundice after 42–70 days (approximately). Repeated attempts to transmit the condition from the positive takes in group A by means of nasopharyngeal washings and material collected on tonsillar swabs during the preicteric and icteric stages failed to produce jaundice in seventeen volunteers (group B).

Case 2 was a man who had infective hepatitis in December, 1943. Syphilis was diagnosed on July 20, 1944. He was treated in a second Army clinic, in which the incidence of jaundice, once as high as 30%, had recently been reduced to approximately 10%. The patient was given 28 daily intravenous injections of 'Neohalarsine' and became jaundiced 110 days after the first injection and 82 days after the last injection. Blood and fæces were obtained 3 days after his first symptom, and 24 hours after the jaundice was observed.

After 10 days' storage at –20° C and 3 days at 0° C, 0·25 ml. of this patient's serum (sigma-test negative) was inoculated subcutaneously into each of nine volunteers (group C), five of whom developed jaundice 45–80 days later.

The fæces were made up as a 20% suspension in broth, and treated with 10% ether overnight at 0° C. Twenty volunteers (group D) drank 5·0–10·0 ml. of the suspension in orange juice after evaporation of the ether. Six of the twenty volunteers also had 5·0 ml. of the suspension sprayed into the nose and pharynx. None of these volunteers became jaundiced. Later, 7–8 weeks after the original inoculation, fifteen of group D drank 5·0–8·0 ml. of untreated suspensions of fæces collected in the preicteric and icteric stages from patients in group A. None of them became jaundiced.

F. O. MACCALLUM.
M D TORONTO.
Medical Research Council:
Jaundice Investigation.

Reviews of Books

Health and Social Welfare: 1944–1945

Advisory Editor: Lord Horder. (Todd Publishing Co. Pp. 334. 21*s.*)

THIS new reference book aims at providing a directory of departments, organisations, and individuals active in health and welfare work, and a review of varying shades of opinion upon topical health and welfare problems. Lord Horder has acted as advisory editor, and has assembled a catholic selection of opinion. Sir William Beveridge, Dr. Edith Summerskill, Dr. Charles Hill, and Mr. Somerville Hastings have all contributed. Specialised articles cover among other things family allowances, industrial welfare, and rehabilitation. Recent reports by Government and other committees are reviewed; and the different departments, and an exhaustive array of health and welfare organisations, state their purposes and policies. A bibliography covers books and periodicals; films on subjects of medical importance are listed and their distributors identified. Tables of vital statistics are provided, and finally an attempt is made to provide a short "Who's Who in Health and Social Welfare."

This is an ambitious project to inaugurate, particularly in war-time, when there are so many other demands upon the time of contributors, and when delays in printing and publication are unavoidable. A year-book often needs revision almost before it appears. Internal evidence suggests that most of the material in this volume had been collected by the early part of 1944, and it is inevitable that much is now out-dated. Nevertheless, it is a work of reference that all active participants in health and welfare work should find valuable, and future editions are likely to become a necessary part of any medical library of reference.

Advances in Protein Chemistry

(1st. ed.) Vol. 1. M. L. ANSON, JOHN T. EDSALL. (Academic Press, New York. Pp. 341. $5.50.)

IN this volume of nine articles, eight are by American, one by an English author. Each has dealt with a particular aspect of protein chemistry, and a chapter has been devoted to lipoproteins, structural proteins of cells and tissues, the purification and properties of certain hormones, nucleoproteins, the protein of skeletal muscle, and so on. Those who had no taste for Ministry of Food sausages (now modified) may appreciate the article on soya-bean protein, but in general nutritional aspects of the subject have been reserved for volume two, which should appear this year.

Such articles as these make rather dull reading for the man who is not specialising in the same subject, but the best are very good, giving a critical account of published work and a clear statement of opinion. There are some good photographs, particularly of the minute structure of sperm tails as revealed by the electron microscope. The volume is perhaps one for chemists and biochemists rather than physicians, but these chemists must be watched: biochemistry has become the key which will unlock the secrets of botany, physiology, and ultimately of medicine itself.

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TO CORRECT THE BLEEDING TENDENCY IN OBSTRUCTIVE JAUNDICE

AND AMONG THE NEW-BORN

● Wherever haemorrhage occurs associated with low prothrombin levels, 'Kapilon' vitamin K analogue is indicated.

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THE LANCET

LONDON: SATURDAY, MARCH 17, 1945

Whiter Bread

WITH the war in Europe drawing towards its close it was inevitable that the composition of the national loaf should be brought again under discussion, although the food position in Europe, and indeed in the whole world, does not appear to warrant any relaxation. So after an interlude of 3 years the old controversy—white, off-white, or wholemeal—has been raised again in the House of Lords,[1] with many of the old arguments and protagonists, but some new evidence.

The national loaf, made from flour of 85% extraction, was instituted in 1942 to save shipping space, and there was almost complete unanimity among the experts that it was also nutritionally preferable to the previous white loaf of 70–75% extraction. So it remained until last autumn, when the Ministry of Food announced that the national loaf would in future be whiter and made from flour of 82½% extraction. This was done on Oct. 1, and in January they announced that a further reduction had been made to 80%. In the House of Lords debate on Feb. 28 (reported last week) Lord TEVIOT moved that the standard of 1942—i.e., 85% extraction—should be regarded as the minimum compatible with the maintenance of the health of the people, and that if the extraction-rate has been reduced below that standard it shall forthwith be tored. Lord HORDER, in support of the motion, ke strongly of the value from the medical standnt of the flour of 85% extraction, recalling that en, *in March, 1942, the introduction of this* bread s announced, he had said that no single step ich the Government could take was as likely this to raise the level of the country's nutrition. ree years' experience, he said, had proved him ht. Lord WOOLTON explained that the first change s made as the result of a visit he paid to the nistry of Food research station, where Sir JACK UMMOND and Mr. T. MORAN, D SC, had devised a ocess for separating the scutellum of the wheat germ d bringing it into the flour; in this way an 82½% traction flour could be made as rich in vitamin B one of 85% extraction. His scientific advisers were tisfied that the reduction to 82½% could safely be ade without interfering with the nation's health. nce then, he said, it had been suggested that we uld go lower and still get the advantages from a alth point of view with the consumption of less an. The experiment was being tried. The nistry had not got the figures yet to show whether ey were right or wrong. If they found they were rong they would say so and go back; and he ndertook that the Government would not go *below*)% until they were satisfied that it would not be etrimental from the nutritional point of view. ord CRANBORNE remarked that this would not pply to imported flour, mixed with the homeoduced. Lord TEVIOT withdrew his motion, but pressed himself as far from satisfied.

The figure of 85% for the extraction of national flour was chosen in 1942 because below this point the content of some B vitamins was found to fall rapidly, while above it the colour rapidly darkened. The only substance in such a high-extraction flour known to be deleterious is phytic acid, and this can be and has been neutralised by adding calcium. In spite of new milling methods, the investigations of the Ministry of Food's own Cereals Research Station have demonstrated a 10% fall in vitamin B_1 and a 25% fall in riboflavine in the change from 85 to 82½% extraction,[1] though nicotinic acid has risen 6%. The analyses of 80% flours are not yet complete—specimens from some 300 mills have to be dealt with—but they seem likely to contain only three-fifths as much riboflavine as the 85% flour.[2] These are losses of known nutritive factors; but there may be losses of other, unknown, nutrients. Even ignoring such possibilities, it seems that the hopes of Lord WOOLTON and his advisers, that the extraction-rate could be reduced without loss in vitamin content, are not being fulfilled. If so, the Government should at once retrace their steps We see the good standard of health that the nation has enjoyed during the war; we cannot say exactly to which of many factors this has been due; we suspect that the national loaf has played its part; and we do not want to lose any of the ground that has been won.

The advocates of a return to white flour make the most of the popular prejudice in its favour which undoubtedly existed in the past but has been to some extent modified by the experience that a palatable loaf can be made from a flour of 85% extraction. To make their argument nutritionally sound they advocate the enrichment of white flour with some of the vitamins in which it has been demonstrated to be deficient, and point out the value of the milling offals for feeding poultry, pigs, and cattle to provide more meat, milk, and eggs for human consumption. This policy of fortification has been adopted in the United States; but, although it has satisfied the millers and the manufacturers of synthetic vitamins, the product has not obtained the approval of all the nutritional experts,[3] and is unlikely ever to appeal

nutrition.

onvinced

nicotinic acid, riboflavine, and iron had a nutritive value inferior to that of whole-wheat bread, and that an addition of 6% skim-milk solids was necessary before the fortified loaf was equal to the wholemeal loaf Nevertheless, the American Medical Association and Public Health Association are pressing[5] for the perpetuation of the war-time fortification, because of the value of the extra vitamins. The argument which claims that the offals from the milling trade are necessary for feeding stock will easily be disposed of when the war is over and the shipping situation no longer sets the limit to the amount of wheat which can be imported. Stock prefer whole wheat to millers' offals, and there is no compelling reason why the foods for cattle must pass through

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1 *Nature, Lond* 1944, 154, 768.

2 Ministry of Food Cereals Research Station, St. Albans, 1944.

3

4. R. J. Nutrit 25 385.

5. Editorial, *J. Amer. Med. Ass* Jan. 20, 1945, p. 1

the millers' hands if this is not in the interests of the community.

After the war, if the public wants white bread it will no doubt get it; but it should be as a luxury, as fancy bread fortified as completely as possible, and sold at a higher price than the bread of the people. A national loaf of sufficiently high extraction to contain all its own inherent nutrients should be available at a price to suit the poor, in whose diet bread plays so preponderating a part, and the full force of propaganda should publicise its nutritional attractions. As Lord Horder urged in the House of Lords, there should be a specification for our post-war flours. It will have to be changed and added to as knowledge grows, but already it would be possible to lay down minimum standards for vitamin B_1, riboflavine, nicotinic acid, calcium, and iron. It would then be open to the millers to compete for the public favour, provided they kept to the standards, with browner breads containing their own vitamins, or whiter breads fortified with additional ones. In countries whose economy is so planned that there is a large surplus of skim milk it could be used for fortification, but that is hardly practicable here.

So much for the future. For the present, while shipping difficulties continue, we must make our wheat go as far as we can. The Ministry of Food should come out in the open, tell us clearly on what evidence changes are made, and clear up any outstanding suspicions that considerations of profit are outweighing those of nutrition.

Iron Oxide in the Lung

The first description of radiological changes in the lungs of electric-arc welders was given by Doig and McLaughlin[1] in 1936. Of 16 apparently healthy young welders 6 showed generalised fine mottling over both lung fields, and none had a radiographically normal chest. The investigators suggested that iron-oxide particles might be opaque to X rays and produce the picture in the absence of either fibrosis or congestion. Two years later Enzer and Sander[2] in the United States recorded the only necropsy so far reported, and from chemical analysis of the lungs concluded that the radiological opacities were due to iron oxide. Harding,[3] by injecting iron oxide in the form of rouge into the trachea of rats, produced X-ray reticulation in their lungs, without fibrosis, and McLaughlin has shown that suspensions of iron oxide in sponges will cast an X-ray shadow comparable with those seen in the chest. The present war has brought an immense development of electric-arc welding, particularly in the building of ships and tanks. In consequence many men with these X-ray changes are now being seen, and further accounts of them have been given by Sander,[4] Jones and Lockhart,[5] and Groh.[6] There seems little doubt that iron oxide is the cause, and that it can even produce, in the radiogram, nodulation almost indistinguishable from silicotic nodulation.

Cooke[7] in 1930, reporting pulmonary disease in a boiler-scaler of 35 who developed shortness of breath after 9½ years' employment, attributed the changes to flue dust rather than boiler scale, which contained less siliceous matter. Since then further cases of boiler-scalers showing radiological abnormalities in the lungs have been reported by others.[8] Last year Harding, McRae Tod, and McLaughlin[9] described the case of a boiler-scaler.

> The man, aged 61, had never done any other work since the age of 14. In April, 1938, he had dyspnœa and cough, and X rays showed nodulation throughout both lung fields. In December, 1943, he died with a carcinoma in his right upper-lobe bronchus; and sections made from his lung showed typical solid, collagenous, silicotic nodules, pigmented like those in the lungs of coal-miners. The lungs yielded 5·1% of ash. Iron formed 0·6% and silica 0·17% of the dry weight of the lungs. Samples of boiler scale from the ships' boilers scaled by this man contained 10·1% of iron and 8·6% total silica; while samples of the flue dust contained 48 3% of iron and 6 1% total silica.

It seems therefore that in boiler-scalers the radiographic changes are due partly to iron oxide and partly to silica.

In this issue McLaughlin, Grout, Barrie, and Harding give a fascinating account of a third occupational disease in which iron oxide is inhaled and produces changes in the X-ray picture.[10] It appears that silver-finishers polish silver and plate with rouge, and that many have been found to have X-ray reticulation. When one such man died sections of his lung showed collections of particles in the peribronchial and periarterial lymph-spaces which chemical analysis of the lung suggested were iron oxide. The histological sections obtained form an interesting contrast with those from lungs of men with argyria, described by Harker and Hunter,[11] in whom there was a deposit of silver in the arteries of all the organs of the body. The silver-polisher, who showed no argyria, had a far greater deposit in the lungs, but the radiological appearances, though partly due to silver, seem to have been mainly due to iron oxide.

It has always been difficult to assess disability in men showing this type of diffuse shadow in radiograms of the chest, and this difficulty is responsible for the complexity of the present silicosis legislation. Clearly, however, boiler-scalers should be covered by these schemes under the Workmen's Compensation Act. The principal associated symptom is shortness of breath, and the only method of measuring it is by estimating the vital capacity—a somewhat unsatisfactory criterion, since it is influenced by the temperament of the patient and his ability to cooperate. There is a tendency to assume that because iron oxide does not cause fibrosis in the lung it does not cause disability; but this does not necessarily follow. The lung is an elastic organ, and if its lymph-spaces are plugged with solid iron-oxide dust its elasticity may well be impaired, with a corresponding reduction of vital capacity. It will, however, take a generation to establish such impairment beyond doubt; and in that time methods of prevention should have stopped all harmful dust getting into the lung. We trust it will not be long before exhaust ventilation in factories is taken as much for granted as are household drains in the cities of today.

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[1] Doig, A. T., McLaughlin, A. I. G. *Lancet*, 1936, i, 771.
[2] Enzer, N., Sander, O. A. *J. industr. Hyg.* 1938, 20, 333
[3] Harding, H. E. *Brit. J. industr. Med.* 1945. In the press.
[4] Sander, O. A. *J. industr. Hyg.* 1944, 26, 79.
[5] Jones, T. R., Lockhart, J. A. *Texas St. J. Med.* 1944, 39, 532.
[6] Groh, J. A. *Industr. Med.* 1944, 13, 598.
[7] [illegible]e, W. E. *Brit. med. J.* 1930, ii, 816.
[8] Williams, H. M. 19th *Rep. Welsh nat. Mem. Ass.* 1931, p. 153; Todd, P. G., Rice, D. *Lancet*, 1944, i, 309; Dunner, L. *Brit. J. Radiol.* 1943, 16, 287; Dunner, L., Hermon, R. *Ibid*, 1944, 17, 355.
[9] Harding, H. E., Tod, D. L. McR., McLaughlin, A. I. G. *Brit. J. industr. Med.* 1944, 1, 247.
[10] Their article was received for publication on Jan. 19, 1944.
[11] Harker, J. M., Hunter, D. *Brit. J. Derm.* 1935, 47, 441.

Hormonal Stimulation of Lactation

The discovery by Stricker and Grueter[1] in 1928 of the lactogenic (lactation-initiating) activity of anterior-pituitary extracts inaugurated a new era in lactational physiology. An entirely new field was thus opened up which research workers were quick to explore, with the result that prolactin (anterior-pituitary lactogenic hormone), regarded by most authorities as the anterior-pituitary hormone specifically responsible for the initiation of lactation, is now available in what appears to be the pure state for laboratory studies—the first anterior-lobe protein hormone to be so isolated. Active preparations of partially purified prolactin have been available since the middle '30s, and partly because of preliminary reports of successful stimulation of established lactation in animals with crude anterior-pituitary extracts, hopes were entertained that prolactin preparations (the purer the better) might prove useful for the treatment of deficient lactation in the puerperium. No doubt because of difficulties familiar to every clinician responsible for the management of human lactation, comparatively few well-controlled clinical trials of prolactin have been carried out, but such studies as have been reported have been far from uniformly successful. Perhaps the most promising results were those of Kenny and King,[2] but these apart, a survey of the published work leads to the disappointing conclusion that prolactin therapy offers little guarantee of certainty in the treatment of human lactational deficiencies.

The studies of Folley and Young[3] on the galactopoietic (lactation-stimulating) activities of a series of ox anterior-pituitary extracts in cows go far towards explaining the comparative failure of prolactin as a galactopoietic agent. These workers found that galactopoietic potency was more closely related to glycotropic (anti-insulin) activity than to prolactin content as assayed by the convenient and universally used pigeon crop-gland test, and their results led them to the conclusion that galactopoietic activity is due to a complex of anterior-pituitary hormones of which prolactin is only one of a number of coöperating partners. It is therefore not surprising that commercial prolactin preparations, standardised solely for prolactin content by the pigeon test, have not always proved as efficacious as hoped for correcting lactational deficiencies in women. As Folley and Young[4] have pointed out, the puerperal woman may with reason be regarded as physiologically more comparable with the lactating cow than with a creature so remote in the phylogenetic scale as the pigeon; so a convenient method, based on the stimulation of lactation in a mammal, for the assay of the galactopoietic potency of anterior-pituitary extracts intended for clinical use, is urgently needed. There are obvious possibilities for the clinical use of crude saline extracts of ox anterior lobe, such as were found by Folley and Young to be more active, as tested on lactating cows, than purified prolactin preparations, but the use of such extracts might be attended by diabetogenic effects or severe local reactions; so clinical trials along these lines would need careful control.

Recent experimental studies in the field of lactational endocrinology have suggested other ways of stimulating human lactation. Œstrogen, for long successfully used for the prevention or suppression of undesired lactation, can also, it appears, act as a
Folley[5] showed
to lactating cows
exert a protracted
galactopoietic effect by increasing the concentration of solids in the milk with no diminution of yield. Later, this general principle was strikingly confirmed by the demonstration[6] in the same laboratory that virgin goats could be brought into lactation merely by treatment with synthetic œstrogen. Here, of course, the œstrogen is involved in two distinct processes—growth of the mammary gland, and the initiation of lactation. Papers in a recent number of the *Journal of Endocrinology*[7] describe the extension of this work, with some prospect of ultimate application on a practical scale, to heifers and cows. These interesting lactogenic and galactopoietic effects of œstrogenic hormone almost certainly involve activation of the anterior pituitary, and there is some evidence that an important factor determining whether the response is stimulatory or inhibitory is the level of œstrogen attained in the body fluids. In general, stimulation requires lower doses than inhibition, but a number of factors are probably involved. So far these findings do not seem to have been applied to puerperal women, but in view of the striking results obtained with farm animals, clinical investigations along these lines seem worth while.

Yet another hormonal agent for the stimulation of lactation has been revealed by the studies of Graham,[8] and others who have confirmed and extended his conclusions, which have shown conclusively that thyroid hormone has a well-marked galactopoietic effect in lactating cows. Happily, practical difficulties which precluded the large-scale application of this work have largely been solved by the discovery of Ludwig and von Mutzenbecher,[9] following up earlier work, that by iodination of tyrosine-rich proteins such as casein, iodo-proteins exhibiting the biological activity of thyroid hormone are formed. Since iodo-casein can easily be made from materials which are plentiful it is obvious that wide possibilities are opened up for the use of this material, fed to cows, for increasing the milk-supply. Preliminary reports of successful stimulation of lactation in cows by feeding iodo-casein have been made by Reineke and Turner,[10] and Blaxter.[11] The clinical use of this substance for purposes for which synthetic thyroxine or dried thyroid gland have hitherto been used is worth investigating, and although the available clinical reports on the use of thyroid preparations for correcting lactational deficiencies are not very encouraging, it would be desirable to reinvestigate the problem using iodo-casein. With thyroid hormone, as with œstrogen, overdosage will lead to responses very different from those intended, and though the amount per kilogramme found suitable for cows may serve as a rough guide, the dosage factor will need careful investigation by those conducting clinical trials.

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[1] Stricker, P., Grueter, F. *C.R. Soc. Biol. Paris*, 1928, 99, 1978.

[2] Kenny, M., King, E. *Lancet*, 1930, ii, 828.

[3] Folley, S. J., Young, F. G. *Proc. roy. Soc.* B, 1938, 126, 45; *Biochem. J.* 1939, 33, 192; *J. Endocrinol.* 1940, 2, 226.

[4] Folley, S. J., Young, F. G. *Lancet*, 1941, i, 380.

[5] Folley, S. J. *Biochem. J.* 1936, 30, 2262; Folley, S. J., Scott Watson, H. M., Bottomley, A. C. *J. Dairy Res.* 1941, 12, 1.

[6] Folley, S. J., Scott Watson, H. M., Bottomley, A. C. *Ibid*, 1941, 12, 241.

[7] *J. Endocrinol.* 1944, 4, no. 1.

[8] Graham, W. R. *J. Nutrit.* 1934, 7, 407.

[9] Ludwig, V., von Mutzenbecher, P. *Hoppe Seyl. Z.* 1939, 258, 195.

[10] Reineke, E. P., Turner, C. W. *Res. Bull. Mo. agric. Exp. Sta.* 1942, No. 355.

[11] Blaxter, K. L. *Nature, Lond.* 1943, 152, 751.

Annotations

A NATIONAL COLLECTION

At the request of the War Office Dr. Joan Ross has arranged an exhibition of the specimens, drawings, and photographs which form the nucleus of the new collection illustrating war surgery designed to replace that lost through damage to the Royal College of Surgeons. The material has been collected from various sources—from civilian casualties, and from the fighting Services in the Low Countries and Italy. Much of the material was collected at the front by Dr. Ross in person. The specimens and illustrations are representative of all types of war injury. Drawings by Mrs. C. G. Ehrenborg (Cecil Trew) are the results of a tour with the 21st Army Group in Holland, and accurately record important details of colour (for example in asphyxia), as well as illustrating points in technique and treatment.

Serial coloured photographs, by Mr. P. G. Hennell, taken during the progress of treatment, are particularly striking and informative. Among these a series illustrating decortication of the lung for fibropurulent pleurisy or organising hæmatoma is outstanding. There is also an interesting series illustrating penicillin irrigation of flesh wounds. Later, this method was superseded in Holland by penicillin intramuscular drip, but now opinion is veering again towards local treatment. Other good exhibits demonstrate the pathology of gas-gangrene, differences in frostbite sustained by members of the RAF when barehanded and when gloved, blast lesions, and injuries caused by mines—which last, unfortunately, may continue to be seen long after hostilities cease. It seems that the Italian peasants already have a precautionary measure: when setting out to till a field they send their oldest donkey on ahead. One set of drawings shows jeep ambulances, Dakota aircraft fitted with stretchers, and other methods of transport for the wounded. Some remarkable examples of multiple injuries are illustrated; the survivors of these would certainly have died before surgery reached its present efficiency.

The exhibition on view at the Royal Society of Medicine, has had great interest not only for those engaged in treatment but for those concerned with research. Much that has been contributed will provide material for study for many years to come.

PENICILLIN IN ANTHRAX

In his early work on penicillin in 1929, Fleming observed that the organism of anthrax was inhibited by this substance, and Murphy and colleagues[1] have now employed it successfully in human anthrax. Their three cases were all of the non-bacteræmic cutaneous type, and confirmed bacteriologically.

The first, a white woman wool-worker, did not pay any particular attention to her lesion until days after its appearance, when she was admitted to hospital. The lesion was then about 2 cm. across and caused swelling from the wrist to the antecubital space. Penicillin was given in a continuous intravenous infusion for five hours, and she received 25,000 units. By this time the erythema and induration about the lesion had stopped spreading. The intravenous infusion was restarted and continued for twenty-four hours, a total of 175,000 units being given. Then by the intramuscular route the patient received 12,500 units two-hourly for 48 hours. The course of therapy lasted a little over three days, by which time she had received 475,000 units of penicillin, of which 300,000 was intramuscular. The temperature became normal at the end of eighteen hours of therapy. The pain disappeared almost immediately, and at the end of four days the erythema and induration had disappeared, while the vesicles had become dry. She was discharged from hospital on the ninth day.

The next patient was a woman with a typical lesion on her face, 2 cm. in diameter. For fifty-three hours she was given a continuous intravenous infusion of penicillin, receiving 225,000 units in this manner; then non-anthrax developments necessitated a change to the intramuscular route, by which 8000 units was given. The penicillin therapy lasted three days. Twelve hours after its commencement the erythema and serous discharge had disappeared. At the end of seventy-two hours of treatment all œdema had gone, and the lesion was quite dry and appeared innocuous. Smears and cultures taken on the second day of the disease and onwards were negative. She left hospital on the ninth day.

A third woman had a small pimple on the ulnar aspect of her left forearm. She received a dose of staphylococcus vaccine, but a smear next day showed *B. anthracis*. The lesion was 2 cm. in diameter. By continuous intravenous infusion 100,000 units of penicillin was administered, and when 40,000 units had been given erythema and induration of the lesion had decreased. After 100,000 units the lesion looked dry and the erythema had disappeared. Smear and culture on the fourth day was negative, and the patient was discharged from hospital on the tenth day.

Murphy and his colleagues conclude that "in anthrax a total of 100,000 units of penicillin is certainly the minimum effective dose, and a total of 200,000 to 400,000 given at the rate of 100,000 units per day should serve to evoke a satisfactory response in the average uncomplicated case of cutaneous anthrax." When penicillin is available it seems to be the drug of choice in this disease.

DECORTICATION IN HÆMOTHORAX

For a simple hæmothorax the principles of treatment have been clearly laid down. The blood should be removed early and completely by aspiration, which must be repeated until the chest is dry. This will encourage re-expansion of the lung, and a full return of function can be hastened by special inspiratory breathing exercises, whose importance can scarcely be overstated. There is, however, the more complicated form of hæmothorax in which clotted blood or fibrin is found and in which the danger of infection is considerable. Conservative treatment in this type of case is but rarely followed by full expansion of the underlying lung. Clotting or delay in aspiration produces an encysted collection of fluid, clot, and fibrin, with firm fibrous walls which hinder expansion of the lung and restrict the movement of the chest. Even if infection is not added to the clotted or encysted hæmothorax, the chances of complete recovery are slight, and the usual sequel is an immobile area of chest with flattening, deformity, and deficient ventilation. The term "frozen chest" gives a graphic idea of the disability encountered. Operations for removal of clot and fibrin and of drainage for infected hæmothoraces often fail to bring about rapid recovery. With skilful surgery a large or even total pyothorax may eventually leave a well-functioning lung, if the case is carefully observed and subjected to continuous physiotherapy in the form of expansion exercises: but the process will probably take months. The same applies, to a lesser extent, where there is retained clot and fibrin.

The question is how best to deal with the fibrous tissue that speedily becomes laid down in the walls of the hæmothorax cavity. The parietal thickening is always greatly in excess of the visceral resistant cover, and, though this latter is generally regarded as the more important, Price Thomas and Cleland, opening our present issue, suggest that removal of the visceral layer without clearing the parietal thickening is not likely to give a perfect result. If these rigid layers are removed the lung and chest wall can come together and regain their normal function. The use of chemicals as solvents for fibrous tissue has not met with much success; the hypochlorite solutions which were at one time favoured in the treatment of chronic pleural infection are now only occasionally used. Claims for azochloramide as a fibrous-tissue solvent are being tentatively advanced, but determined attack can only come from active surgery. The planned operation which is covered by the term decortication is an elaboration of the procedure originally suggested by Delorme in 1896 for the treatment of chronic empyemas. Though the operation was occasionally practised before this war, it is only since chronic hæmothorax has become recognised as a common result of battle injuries that it has been revived and elaborated. Price Thomas and Cleland remove not only the pulmonary fibrous barrier but also that over the chest walls and in the angles of the cavity. The operation (performed through a thoracotomy) may be associated with severe shock and requires strict attention to detail if subsequent infection or re-formation of fibrous tissue over incompletely expanded lung is to be avoided. Penicillin undoubtedly reduces the danger of infection and makes it possible for the surgeon to consider operation on infected cases, subject to obvious provisos. As regards after-treatment, the whole essence is to obtain complete re-expansion of lung, particularly at the apex, as soon as possible. Closed water-seal drainage as a temporary measure to induce expansion has proved inadequate, but suction drainage, using a "pull" of 5–6 cm. Hg has succeeded in bringing the lung out to the chest wall. If this contact is maintained for 5–6 days, later collapse of the lung is unlikely.

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[1] Murphy, F. D., La Boccetta, A. C., Lockwood, J. S. *J. Amer. med. Ass.* 1944, 126, 948.

ANOTHER NEW INSECTICIDE

THE scarcity and high cost of pyrethrum and derris, whose active principles were until lately the most effective known insecticides harmless to mammals, have stimulated research into synthetic substitutes, and one of the compounds devised, DDT, has already proved a definite improvement on the vegetable products. Lecturing to the Society of Chemical Industry at Liverpool on March 9, Mr. Roland Slade, D SC, of Imperial Chemical Industries, Ltd., described another promising synthetic compound, the gamma isomer of benzene hexachloride, $C_6H_6Cl_6$, which has been named 'Gammexane.' Crude benzene hexachloride, first made by Michael Faraday in 1825, was found to be a useful though somewhat inconsistent insecticide, and ICI incorporated it in their flea-beetle powder in place of derris in 1943. Its activity, however, was soon observed to be almost entirely due to the 10–12% of gamma isomer present. Gammexane is a colourless crystalline substance, melting at 112° C, almost insoluble in water but soluble in organic solvents, practically inodorous, and with a bitter taste. It can be used as a spray in solution, diluted with kerosene, or as a stable emulsion in water; it can be dusted as a diluted powder; or it can be volatilised on a hot-plate, being stable at high temperatures. It has proved successful against a wide range of insects and other pests, including house-flies, bed-bugs, lice, and fleas. When scattered at the rate of ½ lb. per acre it killed 97% of the larvæ of *Aedes ægypti* in 2 days, and 100% in 3 days; this compared with 43% in 2 days and 97% in 3 days with the same quantity of DDT. When tested against the African migratory locust, of which ICI maintain the only colony in this country, a bait containing 0·05% of gammexane killed 96% of the locusts in 2 days, whereas 0·2% of DDT killed 57%. A preliminary trial leads to the hope that gammexane will rid agricultural land of wireworms. Toxicity tests have shown it to be highly toxic to fish, but its toxicity to rats is low—30 mg. could be fed daily for 5 weeks without effect. These tests are no doubt being extended to other mammals, and as Dr. Slade said, its action on the skin will have to be carefully watched.

DEVELOPMENTS AT BIRMINGHAM

THE Birmingham experiment in reablement now has four years of successful experience to its credit. During 1944, according to the fourth annual report of the Accident Hospital and Rehabilitation Centre, the buildings of the old Queen's Hospital were finally adapted to suit the needs of the accident service, and the outpatient department, designed for the immediate treatment of such cases, was opened last August. "Short-stay" cases, admitted for less than 24 hours, are accommodated in a ground-floor ward near the department. A burns unit of two wards has also been opened during the year, under the joint direction of the clinical director and Dr. Leonard Colebrook, who has been seconded for the purpose by the Medical Research Council. The rehabilitation department has suffered from having its three section—physiotherapy, occupational therapy, and gymnasium—separated by considerable distances inside the hospital, but despite this, attendances during 1944 amounted to 75,081. A building licence has been granted for necessary alterations; when these have been made all three sections will be intercommunicating and on the same floor. A patients' rest-room, where meals can be served, will form part of the new unit.

In an address to the Royal Institute of Public Health and Hygiene on Feb. 28, Dr. Harold Balme suggested that in the future we should provide many more accident hospitals, or esta[illegible] of reablement in [illegible] his view, should [illegible] reablement centres outside the towns. Experience at Birmingham will be a guide for such centres when they are set up.

FRENCH STUDY OF PERSONNEL SELECTION

A FRENCH mission, headed by Médecin-Général Costedoat, inspector-general of French Medical Services, has been visiting this country to study the methods of selection used in the British Army. They saw how recruits, men requiring reallocation, and candidates for commissions are tested, interviewed and otherwise assessed by the Directorate of Selection of Personnel; and, although they were primarily concerned with the Army and the ATS, they also saw something of the similar selection procedures developed by the psychologists in the Admiralty and the Air Ministry. The mission included Prof. J. A. Stoetzel, of the École Normale Supérieure in Paris, M. B. Lohy (son of Prof. J. M. Lohy, the psychologist, who was killed by the Germans), and other military and naval officers and civilian psychologists.

EPSOM COLLEGE.—*St. Anne's scholarships* will shortly be awarded to girls attending Church of England schools. Candidates must be fully 9 and under 16 years of age, and must be orphan daughters of medical men who have been in independent practice in England or Wales for not less than five years. The value of each scholarship is dependent upon the means of the applicant and the locality and fees of the school selected. A *Christie Pension* of £80 a year and a *France Pension* of £30 a year will be awarded in May to necessitous medical practitioners, fully 55 years of age, who have been registered for five years. Forms of application for the scholarships and the pensions can be had from the secretary's office, Epsom College, Surrey, and must be returned by April 26.

In England Now

A Running Commentary by Peripatetic Correspondents

Professor Grey Turner has made a timely plea for livelier museums, where students will enjoy meeting, talking, and discussing; for the more frequent changing of exhibits, and for a more imaginative set-out. Dr. Joan Ross had gone far to meet him by collecting and arranging the exhibition of war wounds specimens now on view at the Royal Society of Medicine. War wounds at present are, of course, our life, and it doesn't need sugar icing to attract us to such an exhibition; but the set-out is magnificent. Dr. Ross shared front-line risks to get these specimens, and sent them home by air in specially adapted shell-cases. Striking exhibits are the injuries due to land mines. A chart explains three main types of mine. The "teller" mine, which looks rather like a warming pan, has been shown in all the daily papers; the "schumine," which is a wooden-box affair, not detectable by the ordinary metal mine detector; and the "S" mine which jumps up into the air and hurls shrapnel balls, tintacks, &c., for as far as 150 yards. The avulsed limb of such a mine injury is well shown, and the tendons, pulled out of their muscles, dangle from the upper end; the skin is turned back like the gauntlet of a glove and the black mud of Italy can be seen driven deep into the musculature: even after several washings the bottom of the specimen jar is still covered with mud which has filtered out. The sight of this gritty musculature teaches how difficult it is to do an adequate excision in such cases. Another specimen shows the extensive shattering of the calcaneus from a mine injury. Little wonder that so many of these cases end up with an amputation. Other specimens show the pathology of gas-gangrene; and in a remarkable specimen of fat embolism almost the entire corpus callosum appears to be involved.

Mr. Hennell's coloured photographs of the first cases in which local penicillin was tried on skin and muscle lacerations will be of historical value. The immediate end-results of such sutured wounds can be seen, without trace of inflammation, no swelling, not even a hint or a tint of redness. Brain operations, too, have been beautifully photographed. In one of particular interest a fascia-lata graft is being applied over the surface of a brain for an orbital-plate injury. The camera also records the superficially blistered hand of the airman who had worn his kid gloves while fighting, and the scarred claw of the airman who had discarded—possibly carelessly, possibly defiantly—his gloves. The air-raid casualty is shown as he appears first, his face caked with blood and mud, tattooed and battered by bits of brick and mortar, and lashed by bits of wood and glass, which stick out.

Methods and devices are well shown in Mrs. Trew's drawings. We see the Thomas splint being used for the unconscious patient to rest his back on while the shoulder plaster spica is applied; later the splint is withdrawn. The ambulance-drip is shown, and the special clamp device fitted on to the stretcher, so that transfusion can continue while the patient is being carried. Pictures also tell the story of the wounded receiving penicillin. One man, according to the drawing, has four MRC bottles hanging over the top of his bed—giving him intravenous saline into his arm, penicillin into his thigh, gastric tube suction down his nose, and (as he seems to have had a colon and bladder wound), supplying a draining suction suprapubic tube; from the colostomy a tube leads to a petrol-tin at the side of the bed. Heath Robinson might well have been jealous.

The exhibition has one other important advantage: there is not too much of it.

* * *

When my grandchildren gather round, and, just to please me, ask about this war, I shall probably find that some of my choicest recollections concern mud, which is far from being the characterless mess that its lack of literature suggests. We in the RAMC of course do not become so intimate with it as do the infantry, but we often reach a point of close association and mutual attachment. For instance, there was the rich almost oleaginous mud over which we set up our first tents in 1939. This was reputed to produce the best sugar-beet in France, and from its nutritive appearance there seemed no reason to doubt this claim. There was so much of it everywhere however that we were soon seeking alternative useful employment for it, and eventually applied it—with considerable originality as we thought, and suitably mixed with glycerin and heated in petrol cans—for the effective relief of our many rheumatic sufferers. This resulted later in a friendly visit from a medical general, and more unexpectedly in a "write-up" in an American journal.

Then there is the mud of the Nile valley, which might be considered as the primordial slime of all civilisation. Indeed Diodorus and many equally reliable observers went further and asserted that "Out of the mud of the Nile, by the heat of the sun, are engendered frogs, toads, snakes, and mice; for can one not see them oozing out of it during the warm months?"—and seeing is believing. Some of the mice in this interesting series were later recorded as being "perfectly formed in front but unfinished behind," which seems to suggest that the method of spontaneous generation had its percentage of failure, although it was only officially superseded in comparatively recent times by Harvey's famous *Omnia ex Ovo*. From my own observations in the neighbourhood I would have been more inclined to conclude that the scorpion—a known inhabitant of the palæozoic scene—might arise de novo from the local sand; there always seemed to be one lurking in my tent. Or if a synthesis be considered to be more probable in such a case my suggestion would be sand 50%: original sin 50%.

The mud of Iraq is something quite special. It was a standing order in Paiforce that all desert roads were to be considered automatically as shut for three days after half an hour of heavy rain. This resulted in us always having to carry rations for that period if we left camp. The only vehicles which defied this order, and the mud, were the impressive flag-flying "passion-waggons" in which love-lorn brigadiers (who were responsible for these orders) ploughed their way to tea-parties in the Sisters' messes.

Sicilian mud is good, but not nearly so effective. The volcanic origin of its chief constituent reduces the viscosity, and renders it merely muddy. No Wellington boots are ever sucked off their wearer by this second-grade product of a country which, despite the pre-war advertisements, has been shown to be tolerable only for 3 months of the average year.

Of the mud of Normandy a more vitriolic pen than mine must write . . .

* * *

Yesterday I got 3 inches of tricoloured ribbon sent me—my 1939–43 star—and my erector pilæ and spinæ, and a few of the same trade union, went into spasm—i.e., I got a thrill out of it. I remember feeling the same only more so when I got my Scout badge and my 1st xv colours. I am not being näive, but I hold it to be the duty of a naturalist to observe and study dispassionately his own home guineapig, and it is a matter of interest that a middle-aged man, well past the time of display, should thrill when presented with a bit of ribbon; a phenomenon which even *The Golden Bough* deals with inadequately. The fashionable attitude—"O what *have* they sent me now! It's the O.M. No, no. I don't like the colours. Send it back"—deceives nobody; they rarely do send it back.

There is a great need for a really full-undress book on the biology of man, dealing with such subjects, and personally I think the best criterion of civilisation is the degree of the understanding of man by man. In many ways the Americans are more civilised than we are. For instance, I learn from an American magazine that Mrs. Eisenhower is just charming Mrs. Eisenhower, runs her flat, stands in queues, and is just an ordinary citizen. In England the female tends to assume the cock's plumage; even the wife of the Minister of Twiddly will certainly be chairwoman of half a dozen societies for helping somebody and do very good work. But it is an illogical position; it is a survival from the time when the family was the unit, not the individual.

CORRIGENDUM.—In our leader on scrub typhus last week the temperature needed for mites to become active should have been stated as 65° F.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

Sir Archibald Sinclair, Minister for Air, and one of the last orators in the tradition of Gladstone, in the discussion on Air Estimates pointed out that "The extent of our mastery in the air is illustrated by the reduction in casualties incurred by squadrons of Bomber Command." It is even more vividly illustrated by the photographs of destroyed Cologne and other German cities taken from ground level. This "swelling crescendo of destruction" surging forward into Germany is one of the most astonishing features of the war. The problems which the medical and more especially the hygiene organisations of Civil Affairs will have to deal with in Germany are great.

Since March 13, the hours of sitting of the House have reverted to something like pre-war conditions. During the war the House has been meeting at 11 and adjourning at 5.30 or 6.30. Now the time of assembly is 2.15 and the hour of closing 9.15 with an adjournment extension for half an hour. On Friday, as before the war, the hours will be 11 AM till 4 PM. Change of hours of the House do not make a peace, but they are at least an indication of the way the peace-wind is blowing.

Miss Rathbone was the first speaker in the debate on family allowances after the opening by Sir Wm. Jowitt, and she described herself as the Grandmother of the Bill. She might have claimed a nearer relationship, as it is certainly largely owing to her advocacy and persuasive argument over years that the Bill now comes forward. The opinion in favour of making payment to the mother is so widespread that it seems likely that there will be no division when the matter comes to be decided by an amendment on the Committee stage.

The date for beginning payment of the allowances will be on an appointed day "after the war," and the day for the coming into existence of the milk and meals addition will depend on the local education authorities. Some authorities provide them already, but not all children are provided for, and more explicit information and more guarantees of delivery of milk and meals to all are needed. These allowances will affect over 2½ million families and nearly 4½ million children.

At one time it seemed unlikely that the Government's series [illegible]
surai [illegible]
Serv [illegible]
is ce [illegible]
is no [illegible]

This week's Bill on income-tax has a special interest for the medical, dental, and other professions, as it substantially increases allowances in respect of all kinds of medical necessities. The present proposals will mean that a doctor purchasing a motor-car will get an immediate allowance of 20% for depreciation plus 25% for wear and tear for the first year. Subsequent allowances for depreciation will be at the rate of 25% of the balance outstanding. A dental chair, or other expensive item, will be dealt with in the same way. Purchases of professional equipment, instruments of all kinds, and other necessary items, will be allowed against income at time of purchase, if of reasonably small amount; if the amounts are large, they may be treated in the same way as payments for motor-cars. These arrangements will, it is hoped, be of value to doctors [illegible]
ar [illegible]
be [illegible]
m [illegible]
with what is at present being done. A report of the Far Eastern regional committee of UNRRA which was held at Sydney, Australia, from Feb. 15 to 20 under the chairmanship of Mr. T. F. Tsiang, representative of the Chinese Republic, is given in Hansard. It was at this meeting that Mr. Evatt, as representative of Australia, called for vigorous attack on the relief problems and, on his proposal, a resolution was passed for action by UNRRA, the governments and other authorities concerned, to provide relief immediately upon liberation with the maximum degree of decentralisation.

No doubt his words will find an echo in the House of Commons, and the lead given by the meeting in the Far East may stimulate action in Holland, Belgium, France, and Italy.

FROM THE PRESS GALLERY

Family Allowances

In moving the second reading of this Bill in the House of Commons on March 8 Sir **WILLIAM JOWITT** said that the Government's primary object was to ease the financial burden which at present oppressed parents with large families, and so promote the health and well-being of their children. But this Bill was not intended to be an answer to the complex problem now engaging the attention of the Royal Commission on population. If they were aiming at population family allowances could at their very best be merely a partial aid. Under any [illegible]
[illegible] hether in capitalist or
[illegible] which the worker got
[illegible] ich he rendered; it could not depend on the size of his family. The needs of a father of a large family, if he was to keep his children in a decent state and in health, must obviously be very different from the needs of a man without children, and Sir William went on to quote the Vicar of Wakefield, who had six children and who was "ever of opinion that the honest man who married and brought up a large family, did more service than he who continued single, and only talked of population." The Minister emphasised however, that the object of the Bill was not to filch from parents their responsibility, but rather to help them to discharge that obligation as they would desire. Moreover, the Bill must be regarded in its complete setting, with antenatal services, maternity services, child welfare, school meals and national health services. Still, after every allowance had been made for these schemes, there remained a gap that could only be filled by cash payments made without a contribution or a means test by the Exchequer.

The Government had decided to leave the question whether the allowances should be paid to the father or to the mother to a free vote of the House at the committee stage. But if they decided in favour of payment to the mother the House must realise that so far as income tax was exigible on the amount it would be payable by the father. Nor must it be thought that by paying the mother the father was relieved from the duty, morally and by law, to maintain his children.

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[illegible] because
[illegible] nother to
the wife. All that had been said about the appointed day on which the Bill was to be brought into operation was that it should be after the war. He was expecting to receive applications from 2,500,000 families in respect of 4,400,000 children. The task of getting the necessary machinery in order was a very big one, and it was obvious that payments could not be started in the near future.

Miss **RATHBONE**, who opened the debate as grandmother of the [illegible] of the allowance was too [illegible] too low. Sir **WILLIAM** [illegible] red to see more of the allowance in cash and less in kind. Dr. E. **SUMMERSKILL** put forward a plea for the illegitimate child who was usually the first and only child. Mr. A. **BEVAN** asked what justification there was for not supplementing unemployment benefit or workman's compensation by these allowances?

UNRRA Conference at Sydney

In the House of Commons on March 7 Mr. **GEORGE HALL**, Und [illegible] a
statement [illegible] ns
Relief and [illegible]
from Feb. [illegible] F.
Tsiang, re [illegible] is
Majesty's Government were represented by Sir Paul Butler, a distinguished member of the Foreign Service, with wide Far Eastern experience. Australia, France, India, the Netherlands, New Zealand, and the United States of America were also represented. The subcommittee on agriculture submitted recommendations

to increase the production of rice and encourage the use of alternative cereals in liberated areas, and for the establishment of a veterinary consultative body for the Far East, similar to that suggested for Europe. The subcommittee on health presented a draft agreement for the health and sanitary control of displaced persons in the Far East. These and other recommendations of the subcommittees were accepted. The committee also adopted resolutions regarding the importance of arranging for transport facilities as early as possible, and the supply of regular information to the committees and the Administration about the conditions in occupied countries. The chairman was given power to call another meeting of the committee, if necessary, before the next session of the Council. The most important resolution adopted was that proposed by Dr. Evatt, which made three recommendations:

(1) that the Administration should arrange with the Governments and other authorities concerned for the earliest possible measures to be taken to provide relief immediately upon liberation;

(2) that the maximum degree of decentralisation should be established between the central and regional offices of the Administration; and

(3) that the officers of the Administration should be selected, with due regard to their special local knowledge, from a wide range of member countries.

QUESTION TIME

Doctors and Military Service

Sir E. **Graham-Little** asked the Minister of Health whether he had considered the example submitted to him of the dissatisfaction amongst senior medical officers serving abroad at the small proportion of newly qualified medical practitioners who were called up for military service abroad in exchange for senior officers and the large number who were drafted into the Emergency Medical Service at home; and whether he would inquire into and remedy these conditions.—Mr. H. **Willink** replied: The great majority of newly qualified medical practitioners fit for military service are already being called up after short periods in resident hospital appointments, which are necessary to provide the experience required for subsequent military service. Resident hospital posts are limited in number to the minimum war-time establishments approved for each hospital by the Central Medical War Committee and it is the policy of that committee wherever possible to call up the holders of the senior posts after a certain period so that a proper flow of young practitioners through these posts to the Forces may be maintained.

Choice of Doctor

Mr. M. P. **Price** asked the Minister whether he would consider the alteration of the regulation which insists that a person in receipt of a supplementary old-age pension should only have a medical practitioner appointed by the public assistance committee of the county; and whether, in future, a free choice of doctor could be permitted.—Mr. **Willink** replied: Most supplementary pensioners are entitled to medical benefit under the National Health Insurance Acts with a free choice of doctor, and only a small proportion obtain medical treatment through the arrangements made by public assistance authorities. These arrangements may with my sanction include a choice of doctor, and sanction for arrangements of this kind has already been given to about 30 authorities.

Women Medical Students

Sir **William Beveridge** asked the Minister of Labour if he was aware that many women over the age of 19 had had their medical studies since 1943 interrupted, after passing their first medical examinations, by national service; that two of the three London medical schools which admitted women were about to hold entrance examinations to select students for the second medical course starting next October, but that successful candidates in the above age category could not be allotted vacancies without his approval before the examination results were known; and if he would allow such of these women as reached the requisite standard at these examinations for securing admission to the schools to accept places provisionally. Mr. E. **Bevin** replied: In consultation with the Minister of Health, I am making arrangements by which medical schools may consider provisionally applications from women of any age who wish to be admitted next October. The question whether selected candidates will be permitted to begin their courses at that date will, of course, depend upon the national situation.

Supplies to Poland

Miss E. **Rathbone** asked the Secretary of State for Foreign Affairs whether any reply had now been received from the Government of the USSR giving permission for a delegation or supplies from UNRRA to reach Poland or any districts in Russia where Polish or other deported persons were in need of assistance.—Mr. A. **Eden** replied: I am informed that the Russian authorities have promised UNRRA facilities for the transit of supplies to Poland. Arrangements for the transit of a delegation are not yet concluded, but the despatch of supplies is not being delayed on that account.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Sir William Collins, who in 1943 gave £100,000 to extend the department of pathology at Lincoln's Inn Fields, has sent the following letter to Sir Alfred Webb-Johnson, PRCS.

My dear President,

> When I gave you the first £100,000 for the endowment of the Department of Pathology and the institution of a Chair of Human and Comparative Pathology at the Royal College of Surgeons, I promised to provide in my Will that you should receive another £100,000 for the College for the endowment of the Department of Anatomy and the institution of a Chair of Human and Comparative Anatomy.
>
> Since then I have visited the College several times and seen the very good work that you are doing, which has inspired me to think over the matter. I feel that if you had the promised second £100,000 today you could straightway inaugurate the endowment of the Department of Anatomy, and we could then both see the two Professorships functioning.
>
> I therefore enclose my cheque for £100,000 for this purpose.

Yours sincerely,
W. H. **Collins**.

A CHAIR OF MEDICINE

The University of Manchester are anxious that medical men serving in the Forces should know of their intention to appoint a whole-time professor of medicine. The new professor should if possible take up his duties on Sept. 29, 1945, but if the doctor appointed is at present in the Services the university would consider postponing this date. The chair will carry a stipend not exceeding £2500 a year, and applications, which should be brief, should be sent to the registrar of the university before April 24. Particulars of the proposed appointment were circulated through Service channels several weeks ago.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED MARCH 3

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1461; whooping-cough, 1462; diphtheria, 470; paratyphoid, 3; typhoid, 13; measles (excluding rubella), 22,480; pneumonia (primary or influenzal), 905; puerperal pyrexia, 124; cerebrospinal fever, 77; poliomyelitis, 4; polio-encephalitis, 0; encephalitis lethargica, 0; dysentery, 399; ophthalmia neonatorum, 67. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Feb. 28 was 1208. During the previous week the following cases were admitted: scarlet fever, 30; diphtheria, 23; measles, 148; whooping-cough, 19.

Deaths.—In 126 great towns there were no deaths from enteric fever, 2 (0) from scarlet fever, 18 (0) from measles, 10 (0) from whooping-cough, 10 (1) from diphtheria, 58 (10) from diarrhœa and enteritis under two years, and 39 (6) from influenza. The figures in parentheses are those for London itself.

There were 11 deaths from diarrhœa at Birmingham.

The number of stillbirths notified during the week was 213 (corresponding to a rate of 29 per thousand total births), including 28 in London.

Letters to the Editor

MEDICAL STAFF COMMITTEES IN MUNICIPAL HOSPITALS

SIR,—As a member of that unpopular class, the Medical Superintendent, and one who—extraordinary as it may appear to many—is proud of the work he does and feels that he is filling a very important function in his hospital, I have delayed entering into the controversy which has gone on so long in the medical press. But reluctantly I feel that the letter of March 3 by "Assistant Medical Officer" calls forth not defence but counter-attack.

Most medical superintendents today are in their 30's or 40's, and out of those I know only two are 60 or over. I know man
voluntary hospitals,
powers, who are o
considered in order
no object in medical staff committees in municipal or voluntary hospitals unless they contain not only the senior but also the junior staff. In many municipal hospitals the senior staff are part-time; only the juniors are full-time, and they are far more intimately concerned with the welfare of the institution. It is one of the functions of a medical superintendent to retain close contact with the whole of his staff, medical as well as non-medical, and he would be a bad superintendent who was unaware of the desires and views of members of his staff.

In my own hospital, and in those municipal hospitals with which I am intimately acquainted, every member of the staff has access at any time to the medical superintendent, and no difficulty is met with in formulating proposals for improvement and alteration in the hospital services. That does not mean that in every case the medical superintendent agrees, or is able when he agrees to persuade the hospital committee to act upon the recommendations; but strangely enough I have ex-
e of affairs in voluntary
mmittee has not invari-
nade by members of the
or individually. Most
ighted when their senior
n the welfare of the hos-
to him or to request an
ospital committee; and
from my own experience the hospital committee has been more than flattered at such a request, and has always granted it.

After a period during which they tended to lose their clinical interest and become administrators solely, more and more medical superintendents are remaining clinicians. They have realised that their work is better understood and can be made more useful to the community, when they retain their clinical interest and maintain their clinical status among their senior staff. Men like Clark of Sheffield and McCormack who was at St. James', Balham, are household names, and bear comparison in their clinical work with any consultant, no matter how eminent.

Halifax General Hospital. H. I. DEITCH.

A CHAIR IN PSYCHIATRY

SIR,—Brigadier James calls attention to the anxiety aroused in Service doctors by the activities of some of their civilian colleagues at home. This anxiety is without doubt acute, widespread, and very real. The proposal to fill the chair in psychiatry at London University by Sept. 1 has caused frank consternation. Service doctors
all they seek is equal
opportu
stance as the writing
on the
up feeling that their
individual futures are being prejudiced and rendered insecure.

Until comparatively recently Service doctors overseas have been able to apply themselves wholeheartedly to their Service duties, in the belief that their interests at home were being jealously safeguarded by their civilian
being rapidly succeeded by
which is worse, distrust.
only too truly. It is essential
that no split in our profession is allowed to develop. Nevertheless, if the profession at home were to discard the principle of equity, such a split would be inevitable.

My work brings me into contact with many Service doctors in all branches of medical work. I am reflecting their thoughts and their views. It is most earnestly hoped that the civilian authorities will in their wisdom realise the urgency of the need to still the doubts and to allay the resentment and anxiety which their proposal at this stage of the war to fill a university chair has stirred up among Service doctors overseas.

J. D. W. PEARCE,
CMF. Adviser in Psychiatry, AFHQ.

SIR,—The London chair of psychiatry is indeed important, for much of the future of psychiatry is involved in its fate. Psychiatry's significance for society has been shown during this war by EMS and Service psychiatrists to be greater than was ever suggested in peace-time, even by the chair concerned. Plans for teaching and research in the subject should be made at the earliest moment possible; and the decision, after some years of delay, to appoint a professor to this—

present eagerness to fill the appointment is one which many will commend.

The decision to allow psychiatrists, both in and out of the Services and the LCC, to apply for the chair is proper, but unless sufficient time is given for all who might be interested to apply, it may not be implemented. You will have heard, Sir, that except in matters which concern operations and their planning, Service channels of communication are no quicker than jungle roads, mountain highways, and the voyages of fighting ships allow, and at times are even slower than this, for the serving doctor has no assured tenure of address. To get and read advertisements, to arrange and get proper references, to formulate a suitable application, and then get it to London, may take some serving psychiatrists more than six months.

London University might do well to follow the example set by my own university which last year invited applications for the vacant chair of surgery at Newcastle.

serving doctors:—

> ". . . the University will make no appointment until it is satisfied that persons serving overseas have had full opportunity to apply, and the professor, if on national service, will not be required to take up his duties until his release from such service on the termination of hostilities or on such earlier date as may be possible."

It is true, as your correspondents have stated, that doctors serving abroad are sensitive about the deprivations they suffer, and at times compare their lot with that o
; but even in the
darke
only when some-
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is responsibilities
to them as to further his future at the expense of theirs. The model statement of Durham University recognised that we "gentlemen in England now abed" can reasonably ask serving doctors overseas for further sacrifices in the present, only if we ourselves zealously guard their future. We can take satisfaction in the certainty that they, at least, can do no personal canvassing for appointments, but we must be careful to ensure that they have the same opportunities of applying in writing as their professional brothers in Britain. There is no need for generosity, but equity is their right.

The profession need not search its conscience because the Goodenough Committee took evidence only from three civilian psychiatrists, and from none of the hundreds of psychiatrists in the Services; it was a non-professional body. But if the only chair in England recommended by it for the responsibility of teaching post-graduate psychiatry were filled before psychiatrists overseas had ample time to apply for it, permanent cynicism would arise in many members of the profession—as any future professor of psychiatry will know.

T. F. MAIN,
Late Adviser in Psychiatry, 21st Army Group.

RETURN OF THE BLOOD TO THE HEART

SIR,—The answer to Dr. Penman's question is very simple. When a tourniquet is applied for the purpose of an intravenous injection the dilated veins become more prominent on clenching the fist because they are pushed against the skin by the swollen and hardened muscle-bellies. If the fist is kept clenched this prominence may in the next few seconds become yet more pronounced as more blood enters the arm, *but it is no greater if the fist is alternately opened and clenched.*

Before Dr. Penman's letter appeared three of my colleagues came to me with the same question. By a demonstration on the arm of one of them I convinced them that this observation was correct. The idea that alternate contraction and relaxation of the muscles increases the distension of the veins by a pumping action is an excellent example of the facility with which the senses can be deceived and practice influenced by belief in a preconceived theory which has no basis in fact. In this case the whole of the profession seems to have been taken in.

Cambridge. FF. ROBERTS.

MENINGITIS FOLLOWING SPINAL ANÆSTHESIA

SIR,—Your correspondents have properly emphasised two major factors which may give rise to infection during the administration of a spinal anæsthetic—namely, the (ab)use of spirit and of "sterile distilled water." But insufficient attention is paid to the certain contamination of the needle if it is held in the bare fingers, whether or not the hands have been thoroughly washed, for the skin can never be rendered sterile. If the hands are wet, however carefully one handles the needle, it is certain to get moistened and contamination has then occurred. Gloves are the obvious precaution, but there is a simple alternative as suggested by Dr. Mills.

The needle is held through a small sterile towel, the hands being *absolutely* dry. To ensure their dryness it is better *not* to wash up; the hands are then consciously recognised as "dirty", and a perfect no-touch technique will be practised. Slight practice is necessary to acquire the knack, but once obtained there is a great saving of time.

Many thousands of lumbar punctures must have been performed in this neurosurgical unit, by this method of holding the needle through a towel, with never a case of resultant meningitis. It is absolutely reliable, and I believe practised by the entire neurosurgical fraternity.

Neurosurgical Unit, Chase Farm Hospital and London Hospital. D. W. C. NORTHFIELD.

PREGNANCY AND PULMONARY LOBECTOMY

SIR,—In your issue of Dec. 16 last Mr. Graham Bryce and Miss Mills remark that there are few recorded cases of pregnancy following pulmonary lobectomy or pneumonectomy. The following somewhat unusual case may therefore be worth recording.

A single girl of 22 was referred on Jan. 4, 1943, to the Nottingham City Hospital from the tuberculosis clinic for "? non-tuberculous unilateral bronchiectasis of the left lung"; surgical resection of the lung was suggested. She was admitted under the care of Dr. S. B. Benton, and investigations in hospital led to the diagnosis of congenital cystic bronchiectasis of the left lung. The right lung was found to be free from disease by clinical and bronchographic examinations. Her physique was moderate, stature below average, and weight 6 st. 8 lb. A definite midthoracic scoliosis to the right was present, which had been treated at an orthopædic clinic when she was 12 years old.

Mr. G. A. Mason did a left pneumonectomy on Feb. 20, and she made a good immediate recovery. On March 8 it was noticed that she was 16–18 weeks' pregnant. Her chest condition was not such as to warrant interruption of the pregnancy, but after arrangements had been made to discharge her from hospital, she had a spontaneous abortion on March 27. The fœtus and placenta were macerated and the fœtus had evidently died some considerable time before. The abortion did not distress her cardiorespiratory system to any extent and she made a steady recovery from this unexpected intervening condition. She was discharged on 6—6½ weeks after operation. Bronchoscopy and bronchography on May 22 showed her chest condition to be wholly satisfactory. Her weight was 6 st. 7 lb.

Some two months later she became a hospital cleaner and she was able to do the work without any respiratory embarrassment. I saw her again at the hospital antenatal clinic on April 28, 1944, when she was 20–22 weeks' pregnant. Her physical condition had improved beyond the standard before pneumonectomy, and her weight was 7 st. 4 lb. Her chest wall was well healed and the right lung seemed normal. She pursued her employment as a cleaner, though advised not to do so, until August 1, when she was 34+ weeks' pregnant. At this time her vital capacity was 1500 c.cm.

An intermediate degree of pelvic contraction was present, but she was spontaneously delivered of a living female infant after a labour of 21 hours on August 28. The second stage occupied 2 hours and normal progress of the labour and her freedom from any cardiorespiratory embarrassment made assistance unnecessary. A careful watch was kept for any undue dyspnœa with each pain in the second stage, but none was observed. Nitrous oxide was given for the delivery only, and was tolerated well. Her puerperium was uneventful and she was discharged with her infant on Sept. 15. Since then her chest condition has remained satisfactory.

This girl seems to have had an unusual tolerance to physical strain, despite her impaired physique. For many years she had to all intents only one normally functioning lung, and this had sufficient reserve to withstand the repeated obstetric demands made upon it.

I must thank Dr. Benton for access to the case-records and Dr. C. L. C. Crowe, medical superintendent of the hospital, for permission to publish this case.

Nottingham. J. B COCHRANE.

ACCOMMODATION FOR WOMEN STUDENTS

SIR,—We, the undersigned, all received our medical education in different medical schools of London voluntary hospitals, which at that time were providing coeducation—namely, St. Mary's, St. George's, University College, and the London Hospital.

In each hospital special accommodation for women students was limited to the provision of a cloakroom and lavatories, and in the case of one or two of them a common-room also. For women resident medical officers no special accommodation was provided; bedrooms, sitting-rooms, common-rooms, bathrooms, and lavatories were used, as they would be in an hotel or boarding-house, without any sex discrimination.

It would therefore appear that there is no legitimate reason on the score of lack of accommodation for delaying the entry of women medical students into the medical schools and hospitals which are at present reserved for men only. It should not be an insuperable difficulty, even in war-time, to provide a common-room (if it is thought necessary), a cloakroom, and lavatory accommodation for women medical students.

DORIS G. LITHERLAND. DOROTHY M. HOWSE.
MARY G. MITCHELL. PHŒBE WOODWARD.

Bournemouth.

COUPONS FOR BELTS

SIR,—We have just had a very good instance of the hardship which you mention in your annotation of March 10. We manufactured a surgical belt for a soldier in hospital with an incisional hernia. Our representative called at the hospital with the completed belt, but as the patient had no clothing coupons the belt was brought back. Soldiers, we believe, get ten coupons a year, and the next issue is probably in June. As we understood the case was very urgent, we broke the law, which incidentally made us liable to fines or imprisonment, and supplied the patient with the belt. At the same time we notified the Board of Trade that we had done this.

Wigmore Street, W1. ALLEN & HANBURYS LTD.

IN MEMORY OF SIR THOMAS BARLOW.—Of his hundred years Sir Thomas Barlow spent seventy on the staff of Great Ormond Street Hospital, and the hospital felt him so peculiarly their own that they held a small "family" service in his honour at their chapel on March 7. Sir Robert Hutchison, who was Sir Thomas's house-physician at the hospital nearly fifty years ago, spoke at the service and said that Barlow would be remembered both for what he did and for what he was.

Obituary

BERTRAND DAWSON

VISCOUNT DAWSON OF PENN

PC, GCVO, KCB, KCMG, MD, BSC LOND., DCL, LLD, FRCP

FEW men hold high position for any great length of time. Yet Lord Dawson was a public figure for more than a third of a century. In Edwardian days he was already a famous physician, and during four reigns he was a leader in his profession and the adviser of governments.

His was the greatness of general ability rather than some particular excellence: in many different ways he was a shade better than the average first-class man. He was a good representative of doctors because he was a doctor like themselves—with the same sort of skill, the same interests, the same intentions. He was effective among legislators because, for all his special knowledge, they found him a man of affairs like themselves, in no way eccentric. But he was more than a representative and a politician. Successful, shrewd, a man of the world, he was also a devoted exponent of reform, deeply desiring the health and happiness of other people. In this he sought, and secured, greater influence for medicine: he believed that it must play an increasing part in the modern world, and he strove to obtain for his profession its proper place, and fitness to do its proper work.

He was a doctor first and all the time, and with worldly eminence his bearing towards medical colleagues and students never changed.

Yevonde

THE DOCTOR

Bertrand Edward Dawson was the son of an architect, Henry Dawson, FRIBA, of Purley in Surrey, and was born on March 9, 1864. From St. Paul's School he went to University College, London, where he studied chemistry, physics, and [illegible]
was proud of his B Sc [illegible]
medical problems with [illegible]

[illegible] well grounded in morbid anatomy; for when he had qualified from the London Hospital in 1890, and had held the usual junior appointments there, he became pathologist at the Chest Hospital, City Road; and after joining the London Hospital staff in 1896 he demonstrated to students in the postmortem room until the first professional morbid anatomist was elected in the person of Professor Turnbull.

As a young man he was by no means robust, but he was already a hard worker, taking great pains with whatever task was in hand. This habit of concentration helped to make him eventually one of the best diagnosticians of his day. His first principle seemed to be that, once in the presence of the patient, the clock stopped so far as he was [illegible]

[illegible] Intelligence and experience gave him exceptional ability to pick out the signs and symptoms that mattered. But as a clinician he also had the supreme gift of humanity: his humour was spontaneous, his sympathy ready and real; and, as the saying went, he could get inside the skin of a bus-conductor or a duchess within ten minutes. "An important part of therapeutics," he said, "is a willingness to listen, a perceptive understanding mind, and lucid persuasive exposition." He was at his best, perhaps, with those who had carried responsibilities and were now wounded in the battle of life. In his summing-up, not only [illegible], but the family, the work, [illegible] mpassed. The details of [illegible] with as much attention to the patient's surroundings as to his disease. Dawson was (to adopt the idiom of today) a master of clinical social medicine and reablement. He was not a [illegible] explains [illegible] why the [illegible] thirteen consultants was cured within three days after taking Dawson's "second" opinion.

His contribution to scientific literature was respectable rather than remarkable. In early days he provided many of the articles for Allchin's *Manual of Medicine*, and he later wrote on stricture of the œsophagus, diseases of the stomach, colitis, and paratyphoid. Over many years he made a serious study of hæmolytic jaundice, and he was happy to relate that one of his patients was a lady whose spleen had been removed by Mr. Spencer Wells. Hypertension always interested him, and he preached that it is the bodily reaction of certain types to their environment: he spoke of "these days when diseases of invasion are receding and diseases of stress loom larg[illegible] 1914–18, whe[illegible] consulting [illegible] Expeditionary Force, he published with W. E. Hume and S. P. Bedson valuable work on infective jaundice which but for his efforts might never have been undertaken or recorded.

He was not a scientist of the modern kind: "one can pay him no [illegible]

[illegible] choose as assistants people with a great capacity for work, and the young men chosen to devil for him remember him with gratitude as having provided them virtually with an education. He helped his juniors to pursue original investigations, and in talking of such work to his father-in-law, Sir Alfred Yarrow, persuaded him to endow the Yarrow research fund at the London Hospital.

Dawson was a good teacher, though somewhat irregular in his attendance because he was so often "doing one thing at a time" somewhere else. When he had to retire after 20 years on the senior staff, the London Hospital made him "extra physician" for another 5 years: he would go down once a week, and he afterwards recalled that "no part of my work afforded me more satisfaction and instruction than Tuesday mornings in the wards, often prolonged till the dinner, and sister's appealing look, caused a retreat." Students flocked to "Bertie's" rounds; and no wonder, for like many other good teachers he was something of a showman, and was not content to show single cases. He borrowed patients from far and wide.

> "I remember," writes a former assistant, "a demonstration of aneury[illegible] with carcinoma of t[illegible] mum, together with [illegible] aorta contrasted wit[illegible] the posterior mediastinum. Once in 1924 I suggested to him that he should demonstrate dwarfism and infantilism. His reply was: 'What about giants too?' So a few days later I found myself in Wapping interviewing Adolf Strumpell's famous 8 ft. 2 in. giant then performing in Bertram Mills's circus. Would he come to the London Hospital to see the King's physician for £10? No: he wouldn't come for £20; and in any case he had been X-rayed in Vienna, and then taken to the court of the Emperor Franz Josef."

He got on easily with younger men; and a happy late example of his helpful collaboration was the work done, a little before the war, at Lambeth Hospital, where the London County Council made him consulting physician to their heart centre. Here he took a practical interest in the efforts of Laurence O'Shaughnessy and H. E. Mansell to relieve cardiac ischæmia by inducing vascular anastomoses. Unhappily none of the three authors of their reports is now alive.

Lord Dawson was consulting physician not only to the London Hospital but to the King Edward VII Sanatorium at Midhurst, the Royal National Hospital for Consumption at Ventnor, and the Emergency Medical Service. In 1929 he joined the council of King Edward's Hospital Fund; in 1936 he became chairman of the Army Medical Advisory Board; and he served on the Medical Research Council from 1931 to 1935. During this war he presided over the MRC Committee on Tuberculosis in War-time.

THE KING'S PHYSICIAN

No doctor, perhaps, has had a larger number of distinguished patients, and none heard more of their anxieties. Probably no doctor ever spoke less of what he knew. It was this discretion, coupled with conspicuous ability and good address, that made him an ideal Court physician. His first appointment was in 1907, and he was physician-in-ordinary to four sovereigns.

The illness of King George V in 1928 displayed his power to withstand great strain. He had always taken long holidays, and he could recover quickly from fatigue. Now, an elderly man, he had to bear through long weeks almost the whole responsibility of managing, before the world, a most difficult illness on whose outcome much depended. No-one could have felt the responsibility more keenly: but neither nerve nor judgment failed. "I vividly recall," writes one of his team, "the kindly word which inspired confidence and dispelled my nervousness. He never fussed. When he had chosen his man, he left him unhindered to do the job. Nor did he ever omit to give a young man his due credit in private or public."

He was appointed KCVO in 1911, and CB in 1916 for his war service. In 1918 he was promoted GCVO, and in the following year became KCMG. He was created a baron in 1920, and KCB in 1926. Membership of the Privy Council, a distinction he specially valued, was granted in 1929, and a viscounty was conferred in 1936.

THE PRESIDENT

While he enjoyed everything medical, it can be truly said that Dawson loved his own college. The Royal College of Physicians of London was to him hallowed ground: and to be elected by his brother fellows to be their president for seven successive years—something that had not happened for a century—was to him the greatest honour.

His presidency, from 1931 to 1938, was notable for a change of policy. Fearing lest the creation of the Ministry of Health and the Medical Research Council might deprive the college of its position as medical adviser to the Government, he concluded that it ought to be made more representative of medicine, and therefore more influential, by taking into the fellowship men from the fighting Services, from public health, and from specialist occupations such as pathology, radiology, and biochemistry. He thought it "a reproach against our profession that we do not establish means of giving collective advice when the art of government depends increasingly on our knowledge," and he regarded his college as one of the proper channels for such advice. There are those who have their doubts about the departure thus taken from precedent: they believe that a college of physicians is best confined to physicians. But certainly Lord Dawson raised the national status of his college; he set up committees able to offer advice to Government departments, and he gave its affairs fresh life by encouraging the younger fellows to speak their mind.

In his last months he wrote in favour of association of the Royal Colleges to give them the united influence of an Academy of Medicine. An ardent believer in the Empire, he always liked to think of London as a centre of medical learning and inspiration. Besides an Academy he wanted to see here a single large Empire centre of postgraduate medical education, worthy of its opportunities. He had been dean of the London University faculty of medicine, and he was well aware of the reciprocal advantages of closer ties between medical schools in Great Britain and in the Dominions.

Besides his own college, Lord Dawson was president of the Royal Society of Medicine in 1928–30 and of the British Medical Association at its centenary in 1932. Last year, on the death of Sir Beckwith Whitehouse, the Association, faced with great issues, recalled to their presidency the veteran doctor who had won the esteem of Ministers and public. In his inaugural address he expressed part of his philosophy in declaring that "customs, habits, and feelings, many of them centuries old, must not be suddenly uprooted: rather must the new order be gradually grafted on to medicine's historic past. Such is our English way." But his thoughts, none the less, were on the new order.

THE REFORMER

Already in 1918 Major-General Sir Bertrand Dawson was saying that the need for adequate medical service had outstripped its provision, not only for the masses but even for the well-to-do. He prophesied that people would soon recognise the unsuitability of their homes as places for the treatment of the sick, and that larger institutional organisation must follow. Recognising the general practitioner as the central pillar, he sketched a new service based on local hospitals and clinics, for which the larger hospitals would provide consultant and specialist advice. In 1919 he was able to work out these ideas as chairman of an advisory committee appointed by Dr. Addison, the first Minister of Health. The result was the interim "Dawson report," whose short title is justified by the major part he played in preparing it. The committee proposed a scheme of practice in or around health centres which would offer modern methods of diagnosis and be closely linked with central hospitals. This was constructive forward thinking of a high order. But the report appeared in 1920, and a ruthless "economy" campaign soon afterwards removed all chance of official action on it.

It was in 1920 that Dawson was made a peer. Though Lord Lister had preceded him in the House of Lords, Lister's honour was (as the *Times* points out) retrospective, whereas Dawson's was the first attempt to bring medical knowledge into the Upper House. He rightly regarded this task of spokesmanship as important, and took care to see that the medical view was visible to the Lords whenever necessary. Sometimes perhaps his speeches had less effect than they deserved, because he tied himself a little too closely to the manuscript he had so carefully prepared: few speakers can retain the alert attention of their listeners and carry full conviction if they feel themselves obliged to keep to a previously written text. Nevertheless Dawson understood and impressed his audience as well as those who read him next day.

On his special subject of medical reconstruction he showed characteristic foresight in seeking to introduce into the Local Government Bill, 1929, the "Dawson clause," which, referring to municipal hospitals, said that—

> "A council in preparing a scheme under this section shall have regard to the desirability of consulting (*a*) any body existing in the area which is so constituted as to be representative of the voluntary hospitals in the area, and (*b*) any body existing in the area which is so constituted as to be representative of the duly qualified medical practitioners in the area, including those on the medical and surgical staffs of any voluntary hospitals in the area."

Unfortunately this clause was watered down, and it was left merely that local authorities should "make such arrangements as they think desirable for securing that the functions transferred to them . . . will be discharged after consultation with such body . . . as they consider to represent the voluntary hospitals within the area." Much was lost because the local authorities failed to consult as intended.

In 1928, on the Dogs Bill, he persuasively defended experiments on animals. In 1934 he accepted the challenge of the osteopaths. In 1937, speaking in favour of pasteurisation to meet the danger of infected milk, he could not "see what good it was to spend vast sums on health services and leave this bad sore open year after year." He took an active part in finally shaping the

Marriage Bill of 1937, dealing with insanity as grounds [illegible], thereon [illegible] into a [illegible] brought [illegible]ised that the killing of infants is sometimes provoked by illness, which should be treated as such.

As a medical student Dawson had spoken in Hyde Park in favour of birth-control, and as a medical statesman he had the courage to astonish the Church Congress by a plain-spoken address on sexual relationships, calling for study of their healthy rather than their morbid aspects. He believed in contraception as a means of improving family and national life rather than a means of avoiding bother. Now that the community relies for its revenue of children on voluntary contributions, he held that reproduction is "no longer the exclusive responsibility of parents but one in which the State has a share." The State, by family allowances and otherwise, should remove obstacles to parenthood; but doctors also must take a more responsible part in building up a healthy race. Today we were preventing the death of the unfit but had not planned any adequate substitute. It was proper that the unfit should be preserved and should be given a kindly simple shelter, but no effort should be made to raise them above their biological level, lest they vitiate the race by propagating their defects. "In our duty and desire to help the [illegible] we are being tragically unkind [illegible]tlook Lord Dawson combined enthusiasm for getting the fit citizens to the forefront. "If education is needed to get the best out of a girl's or boy's mind, it is unreasonable to expect that it is not equally needed to make the best of her or his body."

Till near the end of his life he continued to enrich the Lords' debates, speaking constructively on the Beveridge report, on scientific research, and on the National Health Service white-paper. He argued that preventive and curative medicine must be brought into a single service—that all medical services must come under one umbrella—but he favoured slow advance. He wanted the Government to begin with the rationalisation of hospital and consultant services, and leave general practice for the present untouched. He was firmly against employment of doctors by local authorities "naked and unadorned." Yet he believed, as in 1929, that through better opportunities and responsible contact [illegible] the cent[illegible] towards [illegible] "will rise up as the interpreters of health to the people."

THE MAN

The accompanying photograph of Lord Dawson shows him in his physical prime. Later his face changed and its lines grew deeper; but, as the friend of youth, he kept his own so vividly that few were conscious of his years. His face was handsome, with broad forehead and eyes set wide apart.

Careful of his appearance and rôle, he refused to betray weariness of flesh or spirit, but in public was ever brisk and confident, with vitality to spare for others. He would spend all night in his car, with a full day to follow; but the rush, the emergency calls, the cancellation of less urgent matters, the writing late into the night, were taken with an equanimity which preserved his physical frame.

Part of his charm lay in giving, apparently, his whole attention to the person who was talking to him. But it was the charm of a sensitive mind, which was evident also in his letters and speeches. With an attractive faintly raucous voice, he was a master of the short address—the lay sermo[illegible] the memorial tribute at [illegible] the graceful tribute at his [illegible]tter and always ready to forget.

Many great men are a little inhuman, hard—more interested in the thing than the man. Lord Dawson felt a personal relationship towards people and was always ready to give time and trouble to anyone who came to him for help and advice. His advice was of the kind that is taken.

He had great skill in the delegation of work, and was always prepared to accept responsibility for the mistakes of a subordinate, with no further recriminations than one, good honest outburst of remonstrance. He did not like the man who promised more than he could perform ("spread-eagling" he called it), and he had a horror of social snobs. Like many pleasant people, he had an endearing capacity for saying things in a slightly comic way: he advised one of his young disciples to "keep his ear to the ground and his eye on the middle page of the *Times*," and was the first to twinkle at the ludicrous picture he had evoked. He had the gift of selecting the right man; tact in the handling of others; great persuasive powers, partly through logical argument and largely through personal influence; a readiness, even in old age, to see and to be willing to accept completely new ideas. (His attitude was never "Oh no, that won't do," but always "Well, now, there's something in that. Yes, that would be well worth considering. Tell me some more about it.") He had a corresponding breadth of vision: he saw things largely and recognised the important factors in a situation. He was adaptable, and quick to see the acceptable solution of a difficulty. And he had the capacity for hard work to accomplish what he wished. We all have some of these capacities; many have several; but Lord Dawson had them all in that slightly greater degree which made the difference. This combination of undifferentiated talent—simple "ability"—would have led him to the top whatever path he had chosen.

Lord and Lady Dawson were married in 1900 and had three daughters. He was happy in his family life both in Wimpole Street and at their small house at Penn in Buckinghamshire, and many will recall with pleasure their "bachelor" dinner parties in London, with the best of company, carefully selected so as to bring together people who could contribute to the pool of medical knowledge. Lad[illegible]d him in all his work [illegible]rdens. Their town hous[illegible] blitz. and so was the neighbouring house to which he transferred his consulting-room. But he did not leave London, and he died on Marc[illegible] service, arranged [illegible] the British Medic[illegible] minster Abbey next Tuesday, March 20, at 12.30 P.M.*

A PERSONAL TRIBUTE

Sir Alfred Webb-Johnson, PRCS, writes: In the passing of Lord Dawson we mourn the loss of a great man of our generation. His profession, of which he was intensely proud, took pride in him—for he stood above the common herd. Many of us were privileged to know him intimately and were happy to call him our friend. We want to recapture and to keep in memory his charming personality, for "Bertie Dawson" possessed to a [illegible] that springs from a natural [illegible] that is never to be gained [illegible]ings that [illegible] was just [illegible]ple and sympathetic courtesy which won him the trust and affection of his friends and colleagues, pupils and patients.

On committees Lord Dawson was convincing and persuasive, and in quiet discussion he carried his colleagues with him even in what seemed revolutionary proposals. He was a master in the diplomatic handling of people and affairs. He often secured a measure of agreement, and achieved progress, by adopting a practicable and possible path—thus preventing an impasse, in which case there would have been nothing but the toil of a rough journey. He could appreciate opposing points of view and adopt a judicial attitude of mind.

Lord Dawson was always approachable. He was tolerant of criticism and bore no resentment, for that was impossible with his perfect courtesy. I recall that early in this war I [illegible] a Governmer[illegible] in our view [illegible] was lacking i[illegible] thanking me for my letter, and saying: "I never mind receiving frank documents. I will add to my report a summary of our advice which should reasonably correspond to your demands. There is force in what you say, and, if I fail, you must be free to push the matter into the public forum. However, I will try." He tried, and he succeeded.

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* Admission will be by ticket, and application should be made to the Secretary of the British Medical Association, BMA House, Tavistock Square, London, W.C.1.

When necessary none could be firmer than Lord Dawson. I recall that on the last occasion when he was well enough to join in discussions with representatives of the Government on the planning of a National Health Service the argument was frequently advanced that there was no precedent for some of the proposals of the representatives of the profession. He protested strongly against always looking for precedents in the administrative structure of such a plan, for there was no precedent for the proposal to engage the whole of a great profession in an organised public service. He made it perfectly clear that if the administrative framework and the terms and conditions of service were not such as to ensure the freedom of the profession and the efficiency of their service to the people the profession would not coöperate. The Government may yet realise the wisdom of Lord Dawson's advice that the development of a National Health Service must proceed by stages.

The great traditions of his college appealed strongly to him; but, while realising that he was one of the treasurers of a magnificent and glorious past, he always tried to mould policy in the direction of new advance as the only way to be worthy of that trust.

In consultations he was most helpful, not only in diagnosis and treatment but in raising the morale of the patient and in bringing comfort to the sickroom and to the household. The patient of the moment had his whole attention and thought. In dealing with relatives and friends, who often give doctors more trouble and anxiety than the patient, Dawson was a master. In cases of serious illness, with the issue in the balance, he would generally find some comforting phrase, but never a misleading one, in order to relieve and help the anxious relatives.

Lord Dawson earned in full measure Stevenson's tribute to the medical profession: "Generosity he had, such as is possible to those who practise an art, never to those who drive a trade; discretion, tested by a hundred secrets; tact, tried by a thousand embarrassments; and what is more important, Heraclean cheerfulness and courage. So it was that he brought air and cheer into the sickroom, and often enough, though not so often as he wished, brought healing." In the words of the *Apocrypha* Lord Dawson was "one of the leaders of the people by his counsels, and by his knowledge of learning meet for the people, wise and eloquent in his instructions. . . . He was one of those that have left a name behind them, that their praises might be reported."

And so farewell to one who has passed through his time with honour and distinction; one who has made great contributions to health policies, and done much for his fellow men by personal service and wise guidance—one whose influence will remain with us for many years to come.

LARGER ALLOWANCES TO FOSTER-PARENTS.—The London County Council provides for some 1100 boarded-out children, and states that many remain with their foster-parents long after they have passed beyond the care of the council. The rates of payment to foster-parents have been reviewed in the light of a new Home Office circular and increases are proposed which will include some incidental expenses, like boot repairs and haircutting, hitherto covered by separate payments. Foster-parents will receive additional grants for clothing, graded according to the age of the child; and medical and dental treatment and travelling expenses will still be paid separately.

The scales proposed for children under school age or attending elementary schools range from 11*s*. 3*d*. for those up to five to 15*s*. 3*d*. for those over fourteen. Out of these sums the foster-parents have to pay the pocket-money rising from 1*d*. a week to 6*d*. For children attending secondary schools, or junior technical or selective central schools, the rates range from 16*s*. 6*d*. for those up to fourteen to 21*s*. 6*d*. for those between sixteen and eighteen. When the child begins to earn, but before he is self-supporting, the council will subsidise his wages.

On Active Service

CASUALTIES

KILLED

Lieutenant L. C. WOODS, RAMC

DIED OF WOUNDS

Captain JOSEPH CAMPBELL SWANSON, MB CAMB., RAMC

DIED

Surgeon-Lieut. MALCOLM JOSEPH CLOW, MD CAMB., RNVR
Flight-Lieut. ERNEST ALEXANDER WALLIS, LRCPE, RAFVR

AWARDS

DSO

Major E. H. ANDERSON, RCAMC
Major R. W. BOYDEN, RCAMC

MC

Major W. J. HAY, MRCS, RAMC
Captain G. M. KILLPACK, MB LOND., RAMC
Captain G. P. MITCHELL, MB ABERD., RAMC
Captain H. N. SMITH, MRCS, RAMC
Captain J. M. WILLCOX, MB CAMB., RAMC
Lieutenant FERGUSON HARTLEY, RAMC
Lieutenant W. M. WALKER, RAMC
Captain A. D. MCKENZIE, RCAMC
Captain C. A. RICHARDSON, RCAMC
Captain K. A. C. CLARKE, RCAMC
Captain T. C. HOPKINS-HUSSON, IAMC
Captain SUKHDEVNATH ANAND, IAMC
Captain N. S. R. C. MUTHUSWAMY, IAMC
Captain H. F. OWEN, RCAMC
Captain TAYLOR STATTEN, RCAMC
Lieutenant J. G. DES BIENS, RCAMC

MENTIONED IN DESPATCHES

Surgeon Captain W. B. D. MILLER, DSC, MB GLASG., RNVR
Major RUDOLPH STUPPEL, FRCSE, RAMC (killed in action)
Captain D. B. WATSON, MB, RAMC

The first award of the VC in this war to a member of the RAMC has been made posthumously to Lance-Corporal Henry Eric Harden, an orderly attached to a Royal Marine commando troop.

MEMOIR

Major P. McL. GUNN, MC, who was accidentally killed last December, was born in 1916, the third son of Dr. George Gunn, MBE, of Wirral. Educated at Mostyn House School, Parkgate, Sedburgh School, and Edinburgh University, he graduated MB in 1939, and after holding resident appointments at the Royal Infirmary, Salford, and the Royal Hospital for Sick Children, Edinburgh, he joined the RAMC in 1940. Posted to the 9th battalion of the Rifle Brigade, he joined them near El Agheila a few days before the first retreat in Libya, and remained with them until after El Alamein, when because of their great losses they were disbanded. Gunn next joined the 1st SAS Regiment, whose exploits are still to be published. With them he once spent three months behind the enemy's lines, carrying all his medical supplies in his jeep, and caring for the many small parties working in German territory.

H. Southorn-Laws

Among the first troops to land in Sicily, he also made four separate landings in Italy. He won his MC at Bagnara, near Reggio, when his unit came under machine-gun and mortar fire from the high ground overlooking the town and suffered several casualties. He showed great bravery in attending to casualties under the heavy fire which swept the streets, and went forward to dress the wounded of a patrol which had advanced to attack the enemy, and had been pinned down under severe fire.

After the SAS returned Major Gunn was promoted and as medical officer in charge of the much enlarged unit he remained chiefly at the base. But he made flying visits to the various units in France, Belgium, and Holland. One of his brothers is serving in Burma, the other in Italy; his eldest brother, Lieutenant Ward Gunn, VC was killed at Sidi Rezegh with the RHA.

Notes and News

EUROPEAN ASSOCIATION OF CLINICAL PATHOLOGISTS

At the annual general meeting of the association on Jan. 20, with Dr. S. C. Dyke, the president, in the chair, Prof. E. M. Fraenkel (London) discussed *Mould Allergy* in 200 allergic patients. Many more positive skin-tests to moulds had been obtained in England (53%) than on the Continent (16%) with an allergen mixture of penicillium, aspergillus, and mucor extracts; he attributed this to the damp climate which favours the growth of moulds. Allergens prepared from the six most frequent types (sporoteichon, cladosporium, penicillium, aspergillus, mucor, and monilia) gave positive skin-tests in up to 66% of the 200 patients tested with the mixtures and the individual mould allergens. Desensitisation had been successfully carried out.

Dr. E. Obermer (Lausanne), speaking on the use of the *Clinical Laboratory in the Prevention of Disease,* described a comprehensive biochemical technique suitable for periodic medical examinations in health centres, or for individual functional surveys in patients not suffering from organic disease. For this purpose the subject must keep a record of urinary intake, output, and other relevant data for not less than 24 hours; the findings are then plotted on curves. He showed a number of curves which reflected the subject's response to physical or emotional stresses.

Dr. G. Ungar (Paris) described experimental work on the *Bleeding-Time,* which, he said, is independent of blood coagulation and is mainly determined by the state of the capillaries. He mentioned facts pointing to an endocrine influence on the bleeding-time through the pituitary and the adrenal cortex, which appear to act on the spleen. From the adrenal cortex two factors had been isolated which when injected into animals lengthened or shortened the bleeding-time.

Dr. R. L. Worrall (Sydney) advocated the use of intra- [illegible]

A LAYMAN'S VIEW OF HOSPITALS

The opinions of the looker-on have a traditional cachet. Mrs. Norah F. Grensted has set down in an unpretentious pamphlet[1] her impressions of the defects in our hospital system. There is little new, unfortunately, in what she says but she sets out tellingly the many flaws—the waiting-about, the anxiety left unrelieved, the changing of doctors, the fear of the [illegible] ings, t[illegible] hospit[illegible] a social worker, a patient, and the mother of children. Her humanity will appeal to those who believe that kindly dealing is the first and most important aspect of efficiency. Her views on the nursing shortage show the same liberal spirit, and she makes the important point that for those who nurse sick children experience of motherhood is an invaluable asset.

AN ADVANCE IN THE TREATMENT OF LEPROSY

A new method of treating leprosy is reported from Madagascar, according to the French Mission of Information. Dr. Grimès and Dr. Pierre Boiteau, who are responsible for the study, have been using a glucoside extracted from *Hydrocotylus asiatica,* an umbelliferous plant growing on the island. As far back as 1937 they had been experimenting with this plant, but at that time the *chemical composition of extracts* was not fully known, and therapeutic dosage was too close to toxic dosage for safety, though results were encouraging. In 1938, Boutemps, working at the leprosy laboratory at Antananarivo, isolated from the plant a new glucoside which he named "asiaticoside"; this proved to be active and much less toxic than previous preparations. It is insoluble in water, and barely soluble in alcohol, but dissolves well in pyridine. Its chemical nature is being further studied by Devanne and Razafimahery. Boiteau has succeeded in making a solution which can be given by injection, and results obtained so far are said to be remarkable. Ocular lesions are cured at once if treated before the posterior chamber is affected. Diffuse infiltrations disappear, lepromas break down and fill with fluid, burst, and afterwards scar up. Acute digital lesions and perforating ulcers heal completely. Anæsthesia and nervous lesions take a long time to improve, and recovery is equally slow in the muscles, but nevertheless many patients treated in Madagascar have already reached the stage of active reablement. Boiteau and Grimès consider that the glucoside probably acts by dissolving the waxy capsule of the lepra bacillus, thus exposing it to attack by the defensive agents of the body and by other drugs.

University of Cambridge

Titles of the degrees of MB, B Chir were conferred by diploma on the following women during February: E. M. Davies, M. Farquharson, M. H. Jordan, E. M. Kingsley-Pillers, M. P. Shackle.

Royal College of Surgeons of England

Médecin-Colonel Merle d'Aubigné, conseiller technique au Ministère de la Guerre, and two other French military surgeons, Major-Commandant Toulemonds and Captain P. Lance, were welcomed at the Royal College of Surgeons on Thursday, March 8. They brought greetings from the president of the Académie de Chirurgie at Paris, and took back from the president and council of the College greetings of friendship and an expression of hope that it would soon be possible for normal relations between the two bodies to be resumed.

On Feb. 23 in Melbourne, the Duke of Gloucester, who is himself an honorary fellow of the College, presented the *diploma of honorary fellowship to Sir Hugh Devine.* The fellowship was conferred on Sir Hugh in 1939 when he was president of the Royal Australasian College of Surgeons.

Civil Defence Awards

The following medical men have been appointed MBE for their brave conduct in Civil Defence:

Baldev Sahai Kaushal, MB Lahore, MRCS

Dr. Kaushal has served with the Civil Defence Service since the beginning of the war and *on more than one occasion has* [illegible] were cleared.

Herbert Stanley Knight, MB Lond.

[illegible] incident, which took nearly 27 hours to clear up, Dr. Knight stood by the whole night and showed great fortitude in remaining until all the casualties were brought out.

James Leitch Keir Lawson, LRCPE

Dr. Lawson's courage and constant and expeditious attendance at air-raid incidents during a period *of over four years has set a* very high example of devotion to duty. On one occasion he was [illegible] casualty.

Charles Harvey Bateman, MRCS

Houses were demolished by enemy action and people were [illegible]

William Thomas Garthorpe Boul, MD Manc.

[illegible]

Dr. Hubert O'Meara has also been commended for brave conduct.

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[1] Aspects of Hospital Reform. With a foreword by Dr. Howard E. Collier. Obtainable from Mrs. N. F. Grensted, 32, Charlbury Road, Oxford.

University of Sheffield

Dr. H. A. Krebs has been appointed to the newly-created chair of biochemistry.

Professor Krebs, who graduated in medicine at the University of Hamburg in 1925, first went to Sheffield from a post at Cambridge nine years ago and, as lecturer, founded a school of biochemical research which has received support from the Medical Research Council and the Rockefeller Foundation of New York. He has taken an active share in organising nutritional studies for the Government during the war. Dr. Krebs obtained his MA Camb. in 1934.

Mr. A. E. Bender has been appointed research biochemist in the department of pathology to work in association with the Sheffield radium centre.

University of London

Mrs. Mary Stocks, principal of Westfield College, is standing as an independent progressive candidate for London University at the next general election.

Society of Apothecaries of London

On Tuesday, March 27, at 4 PM, at the society's hall, Black Friars Lane, London, EC4, Prof. E. C. Dodds, FRS, will speak on ancient apothecaries and modern biochemists.

Royal Society of Medicine

On Friday, March 23, at 3 PM, at the section of epidemiology and state medicine, Sir Weldon Dalrymple-Champneys will speak on public health in India.

Mental After Care Association

The annual meeting is to be held at Burlington House, Piccadilly, London, W1, on Friday, March 23, at 2.45 PM, when the speakers will include Colonel Y. Kneeland, USAMC, Brigadier G. W. B. James, and Colonel Henry Yellowlees.

Royal Society of Tropical Medicine and Hygiene

A laboratory meeting will be held at the Royal Army Medical College, Millbank, London, SW1, on Thursday, March 15, at 3 PM.

Scholarships in the Colonial Service

The Nuffield Foundation is to provide £30,000 for scholarships to enable Dominion or Colonial members of the Colonial Service now in subordinate ranks to qualify for promotion, particularly by obtaining qualifications in medicine or biological subjects. The scholarships will be open to men and women of any race and will begin in the academic year 1945–46; they will be granted on the recommendation of the Colonial Office and Colonial Governments, and will be tenable in any university or similar institution in the Empire.

London County Council

The following medical men and women have been appointed to the standing committees of the council:

Education committee: Dr. J. A. Gillison, Dame Barrie Lambert, and Dr. E. P. Hulbert.*
Establishment committee: Mr. Somerville Hastings.
Finance committee: Mr. Somerville Hastings.
Hospital and Medical Services committee: Mr. Somerville arrie Lambert, Miss Esther Rickards, Dr. E. P. Stark Murray.*
Health committee: Dr. S. W. Jeger.
Mental Hospitals committee: Dame Barrie Lambert and Dr. Doris Odlum.*
Supplies committee: Dame Barrie Lambert.
Special Committee on Staff (Appeals): Dame Barrie Lambert.

* Coopted members.

Dental Units for the Navy

On behalf of the joint war organisation of the Red Cross and the St. John Ambulance, Field Marshal Sir Philip Chetwode, chairman of the executive committee, has presented the Admiralty with two dental units. The gift was made at the Royal College of Surgeons on March 8, in the presence of Sir Alfred Webb-Johnson and the vice-presidents and members of council. Sir Alfred noted that a high proportion of British dental surgeons are licentiates of the college, which is the home of the finest odontological museum in the world. He pointed out that the units can only be used to their full advantage if they have an adequate staff not only of dental surgeons but of technical assistants who will set the dental surgeons free for operating and research work. The units were accepted for the Admiralty by Surgeon Vice-Admiral Sir Sheldon Dudley, medical director-general of the Royal Navy. The units, which have cost about £1200 each, have equipped with chair, drill, and engine by the Admiralty.

Scientific Film Association

The following films will be shown at 1, Wimpole Street, London, W1, on Wednesday, March 28, at 5.30, and again at 8 PM: The Nose Has It, The Action of Cilia and the Effect of Drugs on their Activity, Open Drop Ether, Unwanted Guests, and Conquest of a Germ. Tickets from the honorary secretary of the medical committee, Dr. S. J. Reynolds, 14, Hopton Road, London, SW16.

MOSQUITO REPELLANT.—Ships going to tropical African ports and the East Indies are now to carry a supply of dimethyl phthalate to be issued to the crew as a protection against mosquitoes when the vessel is in a malarious area. The instructions are to apply a few drops to the exposed parts of the body, avoiding areas round the eyes and mouth, and to the clothing if the mosquitoes are biting through it. One application lasts 4 hours.

Appointments

CAMPBELL, IVOR, LRCPE: medical referee for the sheriff-court district of Oban.
JARRETT, EDWARD, MB CAMB., MRCP: medical registrar at St. Mary's Hospital, London, W2.
MACDONALD, D. S., MB ABERD.: examining factory surgeon for Westbury, Wilts.
MENZIES, A. G. H., MB LPOOL: RSO at Montagu Hospital, Mexborough.
MYLES, DAVID, MB ST. AND.: medical referee for Forfar sheriff-court district.

Births, Marriages, and Deaths

BIRTHS

ADAMS.—On March 5, at Wigan, the wife of Surgeon Lieutenant J. A. W. Adams, RNVR—a daughter.
BAILEY.—On March 8, the wife of Dr. E. H. Bailey, of Woodford Green—a daughter.
FRANKLIN.—On March 6, at Gloucester, the wife of Dr. Hugh Franklin—a son.
GALLEY.—On March 6, in London, the wife of Dr. A. H. Galley—a son.
JEFFREYS.—On March 1, at Cardiff, the wife of Dr. D. M. Jeffreys—a daughter.
KELSEY.—On March 4, at Guildford, the wife of Dr. Denys Kelsey—a son.
LAKE.—On March 6, at Oswestry, to Dr. Lorna Lake (née Meredith Davies), wife of Lieutenant Peter Lake, RA—a daughter.
MACFIE.—On March 3, at Glasgow, the wife of Captain W. G. Macfie, RAMC—a daughter.
RHODES.—On March 8, at Woking, the wife of Captain B. W. Rhodes, RAMC—a son.
TRONCHIN-JAMES.—On March 7, in London, the wife of Flight-Lieutenant R. N. Tronchin-James, MRCS, RAF—a son.
WHITAKER.—On March 9, the wife of Surgeon Lieutenant Allen Whitaker, RNVR, of Guildford—a daughter.
WINGFIELD.—On March 8, in London, the wife of Dr. Alec Wingfield—a daughter.

MARRIAGES

ALMOND—FORSTER.—On March 6, at Frimley, John MacCormac Almond, major RAMC, to Joy Forster Forster, third officer WRNS.
BOON—MILLAR.—On March 3, at Golders Green, Frank Boon, captain RAMC, to Judith Jessica Millar.
DA FANO—DYER.—On March 1, in London, Matthew Da Fano, MB, captain RAMC, to Mina Iris Anne Dyer, ATS Signals
DODD—VALE.—On March 3, at Deal, John A. Dodd to Brenda Vale, MB.
GIBSON—FAIRWEATHER.—On March 3, at Ipswich, Ronald Gibson, captain RAMC, to Thelma Pauline Fairweather.
PHILPOTT—QUARMBY.—On March 3, at Welwyn Garden City, Maurice George Philpott, MB, to Constance Quarmby.
THOMPSON—BACKSTEDT.—On Feb. 7, at Brussels, John Thompson, captain RAMC, of Manchester, to Doreen Backstedt, sister QAIMNS/R.
WATTS—LYNCH.—On Feb. 12, at Northampton, John Aubrey Ewart Watts, FRCSE, to Mary Elizabeth Maureen Lynch, SRN.

DEATHS

BETTS.—On March 29, at Crowborough, William Andrew Betts, CMG, MD EDIN. and CAPE, FRCSE, aged 78.
BRODRICK.—On March 9, at Widemouth Bay, near Bude, Charles Cumberland Brodrick, LRCPE, aged 88.
CARTE.—On March 6, in London, Geoffrey Williams Carte, BM OXFD, FRCS, aged 60.
CHAPPLE.—On March 8, in London, Harold Chapple, M CHIR. CAMB., B SC. ADELAIDE, FRCS, FRCOG.
HOWELL.—On March 4, at Cheltenham, John Howell, CBE, MB LOND., FRCS, aged 73.
SANDERSON.—On March 4, at Cleland, Lanarkshire, Iain Sanderson, MB EDIN., late Colonial Medical Service, Tanganyika Territory.
SCARLYN WILSON.—On March 4, at Camberley, Archibald Scarlyn Wilson, MA, MB CAMB., DPH, of St. Leonards-on-Sea.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

THE HUNTERIAN MUSEUM

YESTERDAY AND TOMORROW*

G. GREY TURNER
MS, D CH DURH., LL D GLASG., F R C S, F R A C S, F A C S
PROFESSOR OF SURGERY IN THE UNIVERSITY OF LONDON,
AT THE BRITISH POSTGRADUATE MEDICAL SCHOOL

JOHN HUNTER was not the first person to create a museum, nor even the first to collect medical preparations. The museum of the Royal Society was started in 1681, and the Ashmolean in Oxford in 1683; and there were others earlier on the Continent. John Hunter's teachers no doubt had their own specimens, and at St. Bartholomew's Hospital in 1726 a room was prepared as a "repository for anatomical or chirurgical preparations." But undoubtedly the great stimulus was William Hunter's collection, which was well started before John made that notable journey from Scotland to join his brother as assistant in the dissecting-room.

John was the youngest of ten children and was born, when his father was 68, at Long Calderwood, the family property in Lanarkshire in the south of Scotland. His early years were said to have been wasted in idleness, and it was constantly held against him that at 17 he could neither read nor write and that part of his youth was spent in a carpenter's shop. But in after life he spoke of those early years spent around his home in the country as of special value in cultivating the powers of
to know about the clouds and
leaves changed colour in the
ınts, bees, birds, tadpoles, and
people with questions about
what nobody knew or cared anything about." Doubtless he had much time to wander about and observe and think; but I cannot believe that he was otherwise entirely unoccupied. In those days in Scotland everybody had to work for their daily bread, and I think we may be sure that he not only helped his mother but also his father about the business of their holding.

The life of the farmyard, as of the countryside, must have been thought-provoking. Crop-bound fowls, pigeon-lofts infested with contagious tumours, lambs with grass-ill, or "sturdy" sheep—all would provide fascinating problems. The accidents to which stock are liable would arouse keen interest in the surgery of injuries and repair, and certainly teach a reverence for the healing powers of Nature. The vagaries of swallowed foreign bodies would arrest attention. What lad could ever forget seeing the intestine of a young horse trailing on the grass after castration, and what inquiries it might
stir- with the ana-
tor ıena of repro-
duı les of all sorts
obt ıng is part of
a h to recall that
in insemination.
Family illness and episodes of the crises of human fate would often be discussed, and in the Hunter household death was all too familiar.

When John was about 18 it was felt that something should be done to help him to make a career and he was sent to Glasgow to help in the workshop of his brother-in-law, a cabinet-maker. Some have rather looked askance at this period in the joiner's shop and have suggested that he might have been better employed. With this I would join issue, for I believe that work with tools, and especially the clean precise tools that joiners employ, is an excellent education for anyone destined to use his hands for his life's work.

When three years later he returned from Glasgow wanting an outlet for his activities, William was sending letters home describing the fascination of his work in London and extolling the opportunities it provided. Probably little persuasion was needed to make John undertake that journey south in search of fame and fortune. Once in London, William's influence and example must have had a very powerful effect. The elder brother was not only a very successful teacher of anatomy but was a fashionable practitioner. Withal he had a passion for collecting. He knew the art of the *preparateur* and his preparations were then regarded as among the best in London.

INCEPTION AND GROWTH OF JOHN'S COLLECTION

It is often wondered how Hunter secured his specimens in his early days; for it has been stated that while he was working as demonstrator for his brother any preparations he put up were placed in his brother's museum. But probably he would remove some portions that were of special interest and take them to his lodgings to dissect in private. Many of us in the same position abstracted portions which were afterwards prepared in the dead of night, perhaps in the family kitchen. In these days, when
supply the needs o
what a wealth of
in the dissecting-
great source of supply were the animals that died in the menagerie then kept in the Tower. He never lost a chance of acquiring anything that would make a suitable preparation. Some were presents from friends. Others were secured by purchase, and we know in connexion with the skeleton of the Irish giant to what length of monetary impropriety he was prepared to go rather than lose some specimen on which he had set his heart.

HIS METHOD OF WORK

The actual labour of making his museum must have been colossal, and there can be no doubt that the major part of it fell on himself. Just think of the dissections, the macerations, the injections, and the display of the pathological material. Then there were the jars to select, and the specimens to be suspended or otherwise displayed, and the tops to be fixed. There were no
ground t to be
covered to be
securely outer
cover of inted,
and pro s the
recording to be done, descriptions to be written, and labels to be fixed—work in which he was not always quite as careful as he might have been, though he was always making notes and no-one can say he was not systematic. There is evidence that he was concerned with all these tasks.

Think again of what it meant to be engaged in this work almost every day for 30 years. In his Hunterian oration the late Mr. Hey Groves suggested that during all this time Hunter added one specimen a day to his collection. His routine was to rise at 5 AM or earlier in summer, and 6 AM in the winter, and go at once to his

he required and had to supervise all that went on. At each of his homes arrangements were made so that he could fulfil his self-imposed tasks (fig. 1).

The methods of specimen-preserving used in those days are worth considering.

There were the ordinary dissections, some of them very

Hunter's original collection contained over 500 of this type. It was a tedious method for the specimen had to be very carefully cleaned, and then packed or distended with air. They were then probably painted with an arsenical preparation and hung up until dry. Finally they were carefully varnished and revarnished and as a rule mounted in jars. Specimens made in this way will often last many years (fig. 2) and there are still some Hunterian preparations of this kind in good condition.

Then there was injection, a method in which he excelled and on which he has left directions; but these do not appear to have conveyed the secret of the art to those who have tried to follow in his footsteps.

The dry bone specimens had all been macerated or boiled—both slow processes to get the best results. There were also the calculi, the plants, foreign bodies, as well as the fossils of which Hunter left so large a collection.

A great deal of his work must have been done by candle-light. Heating too must have been a difficulty, for there was nothing but open grates, and when there was no fire a flint and steel with tinderbox would be necessary to get a light. For his literary labours there were only quill pens, as shown in Reynolds's portrait. His handwriting is good and legible, but occupies a considerable amount of space, and we know that during those very full evening hours he filled an enormous number of notebooks. During his last years he dictated a good deal to an amanuensis, but there is no evidence that any sort of shorthand was employed. The manuscripts taken away from the Castle Street house to suffer so sad a fate at the hands of his brother-in-law Everard Home were said to fill a coach. Fortunately for us there were also many which were not destroyed.

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* Extracts from the Hunterian oration delivered before the Royal College of Surgeons of England on Feb. 14, 1944.

Had Hunter done nothing more than care for his museum, his pupils, his lectures, and his writings, and supervise his amanuenses and artist, he would have been very busy. But these were really only sidelines, for he had a very large practice. His professional work commenced after breakfast when he saw patients at home, and it is said that those waiting were so numerous that they often invaded his wife's drawing-room. At a fixed hour he left home in his coach to make outside visits and for hospital practice, and he never delayed his departure even if persons of importance were still waiting to be seen. He did not return until 4 PM which was then the usual dinner hour. After dinner he commonly slept for an hour on a couch in what was called the afternoon bedroom, and then began what must have been some of the most strenuous work of the day, letter-writing, case-recording, revision, the description of his dissections, and the literary works which eventually gave him lasting fame. Assuredly he scorned delights, and no-one has ever lived more laborious days.

THE COLLECTION AFTER HUNTER'S DEATH

In the latter part of his life the question of making provision for his family became a gnawing anxiety to Hunter. For years his practice had been the best in London and had brought him a large income—as large in relative value as any London surgeon has ever enjoyed. But the expenses of his establishments and of his museum took every penny. Clift, that faithful man, kept a list of those employed in the practice and in care of the collections and stated that, exclusive of the house pupils who paid for their own board, there were never less than 50 persons fed and provided for at Hunter's expense daily.

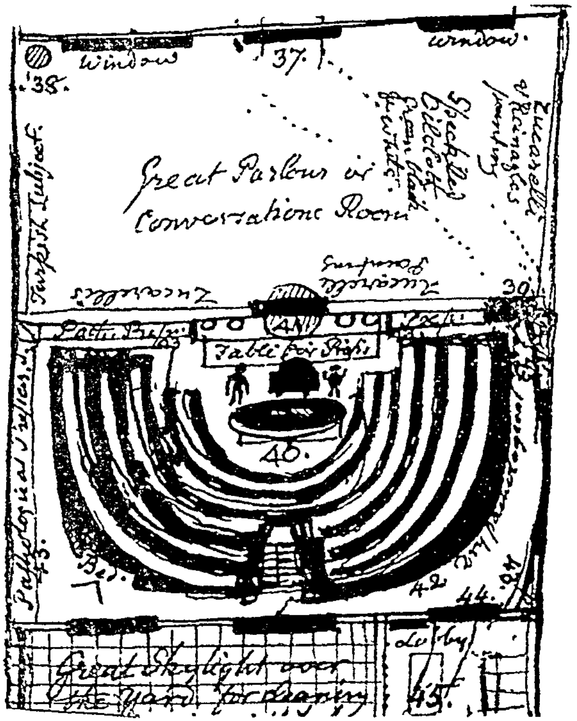
Window
window
37
38
Great Parlour or Conversazione Room
30
Table for Sight
40
42
44
43
45
Bed
Lobby
Great Skylight over the Yard for drawing

Fig 1—From Clift's plan of No. 28, Leicester Square, the home of John Hunter, as it was in 1792 The plan shows the great parlour where medical meet- were held, and the lecture theatre with accommodation for both wet ry preparations

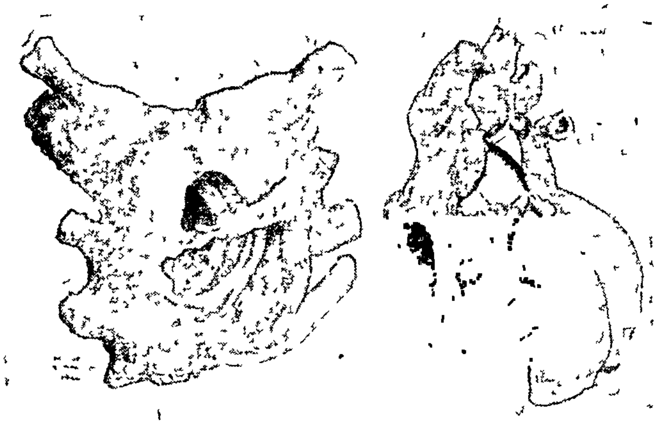

Fig 2—Aortic aneurysm eroding and perforating sternum Dried preparation still well preserved after about 80 years (Durham University College of Medicine, 147/12).

He must have known that his realisable assets, as ordinarily understood, would do little more than pay his debts, and he probably regarded his museum as his one great asset. By his will it was to be offered to the British Government on reasonable terms, sold in one lot to some foreign government, or otherwise disposed of as his executors decided. But at the time of his death our Government were once more involved in a Continental war and they were not interested in the offer. And even the leaders of the scientific world do not seem to have realised the value of the collections, which they probably regarded as only wonderful curiosities. So the preparations on which he had spent £70,000 of his hard-earned money were merely stored in the house in Castle Street. Clift, his faithful pupil, acted as custodian on the miserable pittance of 7*s.* a week; and in addition the trustees made a small allowance for spirit to replenish the specimen jars. At the end of Clift's long vigil the Government were again approached and decided to offer the executors £15,000 for the whole, which sum was voted by Parliament on June 13, 1799, and was accepted. It may seem a small amount for a collection of such scientific value, but at all times medical museums have proved very bad investments.

Having made the purchase the Government had to find some means of getting the collections looked after. Eventually their custody was undertaken by the Incorporation of Surgeons—soon to become the Royal College of Surgeons of London and later of England. After removal of the collection to Lincoln's Inn Fields in 1806 the next thing was to find someone who could at least help to put it in order. Here at last was Clift's opportunity, and he was appointed as conservator at £100 a year, which after 7*s.* a week seemed a fortune! Then it was necessary to set about building a suitable museum for which fortunately there was ample accommodation on the Lincoln's Inn Fields site. The museum was estimated to cost something like £12,000 and a further grant of this amount was made by the Government; but it required a supplement of some £21,000 from college funds to provide a worthy setting.

In 1813 the building was opened and the collections were moved in. At first there was a great deal of muddle and difficulty about getting the specimens arranged and catalogued, and in 1826 the college was only too glad to find Richard Owen, a young surgeon who had established himself nearby, and was waiting for practice. When next year Owen took over the duties of assistant to the conservator at least 3970 specimens had to be examined and described, and for this he had to obtain and examine fresh material and to make some 200 special dissections. Owen was always a comparative anatomist and zoologist, and his energies were almost entirely given to that branch of the collections. By 1830 or thereabout the college found that the accommodation was much too limited, and further additions were built. When Rickman Godlee delivered the oration in 1910 he stated that up to that time the college had spent £500,000 on the collection.

The physiological collection was fortunate in having Owen to act as conservator, but the pathological collection was practically without any special attention at that time The first effective pathological catalogue was undertaken by Stanley, one of the surgeons at Bart's with the assistance of James Paget, then a man of 27 struggling to find a place for himself on the staff of that hospital When Paget undertook the work in 1842 he estimated that it would occupy him for two hours a day for two years, but actually it was seven years before the catalogue was complete The preparations to be catalogued amounted to 1700 Hunterian and 1808 subsequently added. In 1878 a second edition was begun In this Paget had the able assistance of J F Goodhart and Alban Doran, but none the less he examined every specimen and compared its description with its appearances

Day in day out, the collections increased and there was always the problem of which

lines, and hitherto this has been the task of the conservator

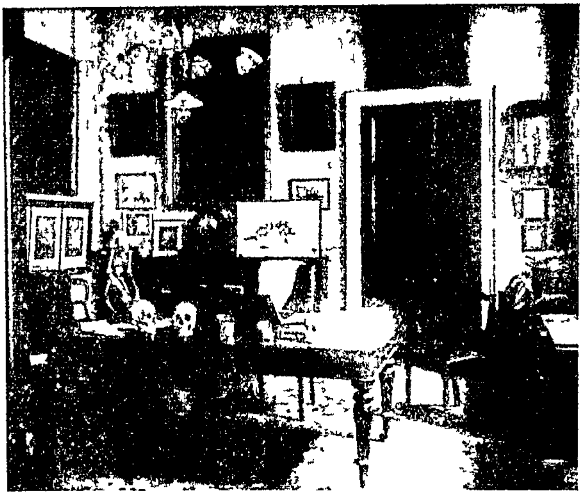
Fig 4—The Conservator's room in the time of Sir Arthur Keith Photograph by George May 1933

THE MUSEUM IN ITS HEYDAY

That great conservator, Arthur Keith, spent 26 of the best years of his life (1908–34) in nursing the collections (figs 3 and 4) Many of us have occasion to remember the museum in those days with gratitude, though not always for the same reason

According to Owen, the marvellous collections in comparative anatomy and osteology, and the physiological series, were the fundamental part of the museum, and it was the part that appealed to generations of scientific workers from all over the world and brought the college such renown As A J E Cave has said, these collections provided material for the solution of fundamental problems incapable of experimental settlement

But I think everyone regarded the museum as the repository of all that was best and most important appertaining to anatomy, pathology, and surgery, both practical and historical My earliest recollections are largely associated with the wonderful dissections and other anatomical preparations, of which there were nearly 500 At no time in the world's history has the art of the prosector produced more beautiful preparations, and this was the standard collection for anatomists

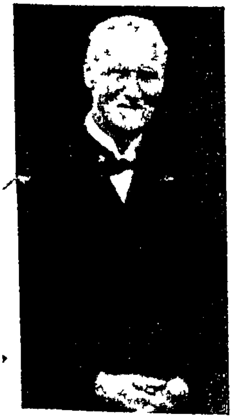
Fig 3—Sir Arthur Keith Conservator 1908 34

The great majority of these masterpieces were the work of William Pearson (fig 5), who started in the college in 1856 when a lad of 15 Pearson worked under five curators until 1914 when at the age of 73 he retired because of failing health, but he lived nine years longer,

engaged as a porter by William Clift and learned from Clift the museum technique that Clift himself had learned from Hunter This information he passed on to his son Thomas who in turn handed the torch to William The combined services of this family totalled 1 3 years

The next outstanding feature of the museum was that wonderful collection illustrating the principles of pathology as apart from regional pathology It was there that the Hunterian tradition was enshrined Such a collection had been envisaged by Hunter and some of his preparations were specially made for this purpose The finished product as we knew it was due to S G Shattock, the shy retiring Shattock, who so well appreciated the fundamental principles that run through the structure of disease in the whole animal kingdom

But even among those who cherished our museum for some special purpose there were few who realised its magnitude, its completeness, or the underlying idea Few there were who knew what a storehouse of treasure reposed within our walls

THE DISASTER AND AFTER

On the night of May 10, 1941, the college museum was struck by a heavy high explosive bomb and by incendi

f the museum, and some parts

oyed, and about two thirds of

the conflagration The story of the steps which had been taken to guard against such a tragedy, the details of the disaster, and the steps taken to salvage and care for what remained of our treasures has been admirably told by Prof Cave, the assistant conservator, in the scientific reports of the college for 1939–40 and 1940–41 It is a sad chapter in college affairs But clearly our duty is to look to the future hopefully and to consider plans as well as ways and means for its restoration

Fig 5—William Pearson prosector to the College of Surgeons for nearly 60 years From a painting by Onslow Ford

THE FUTURE

The disaster not only imposed a greater responsibility but provided an opportunity for some reorientation, and it was necessary to decide in what direction that should be After some months the museum committee were able to present to council a plan for the restoration together with many ideas as to future developments The museum will be reborn in circumstances different from those existing when it first came into being over 190 years ago Then there were no museums devoted to anatomy and pathology in this country, and only one or two London hospitals had a few preparations for the use of their pupils Now all medical schools up and down the country have museums and other institutions are in a position to carry out many of the activities

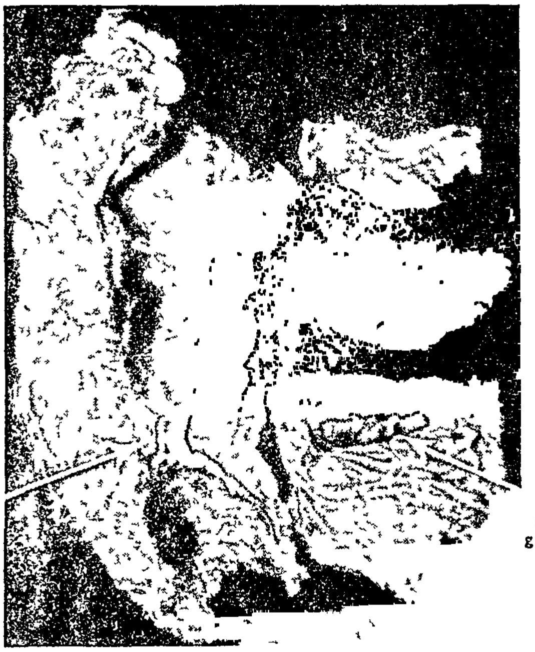

Fig. 6—Specimens from a patient alive and well 25 years after conservative resection of the rectum and 12 years after removal of the hepatic flexure, in both cases for carcinoma.

previously shouldered by the college in the field of zoology and natural history. The council and the Hunterian trustees have therefore agreed that the new museum shall be built up around the surviving collections to illustrate the development, the structure, and the functions of man, together with the accidents and diseases to which he may be a victim, with such reference to the animal kingdom as may help to elucidate the problems involved.

One of the first questions before the committee was the disposal of the surviving Hunterian preparations. The first inclination was that they should be kept together as a precious relic and memorial. More mature reflection convinced us that this would not be in keeping with the Hunterian tradition, and that it would be much better to have them allocated each in their proper sections of the general collection where they might act as a leaven and stimulus. But an idea very much in my mind is the suggestion that when the specimens can be safely returned to the college an exhibition of the whole surviving Hunterian collection should be set up in one of the rooms together with all the existing relics of Hunter which we can get together. This should be attractively set out according to the original plan and should be on view for several months so that those interested may have the rare privilege of seeing the collection as the great man envisaged it.

Among many who have talked about the restoration of the museum there are not a few who have a dread that the new museum will be cluttered with animal skeletons. There are some who have no use for the wonders exhibited by the bony framework of the elephant, the giraffe, or the whale, and no veneration for extinct monsters like the Irish elk, the megatherium, or the armadillo. They may be astonished to hear that it was never the policy of the college to collect taxonomic exhibits; but if some skeleton or part of a skeleton is necessary to demonstrate some special feature in comparative anatomy which leads up to the better comprehension of the structure and function of man, then of course it must be preserved and exhibited. The same general principle will apply to the soft parts of animals, however large or however minute. Just fancy the interest of comparing the œsophagus of the giraffe with its insignificant counterpart in man! Perchance the secret of achalasia may be disclosed in the study of its neuromuscular mechanism.

It is the intention to keep the museum as an up-to-date collection by replacing deteriorated specimens and by constantly adding better ones. Only the very best obtainable should be found on our shelves. But there [illegible] point, and that is the question of the history and the after-history of the cases from which specimens have been obtained. Many a poor-looking specimen is valuable because of the interest of its clinical history, and many another increases in value as the long after-history of the case adds to its interest and importance.

An illustration of the value of keeping the actual specimens was recently provided by a review of some of my old cases in which operations had been carried out for removal of malignant disease of the rectum. Four patients especially were alive and well from 18 to 32 years after the operation, and the specimens allowed us to re-examine them critically and review once again the conditions of growth and to make an estimate of the grading which placed them all in the favourable groups of Broders's classification.

Fig. 6 illustrates the specimen I preserved after first performing a conservative excision of the rectum for cancer. For 25 years the patient, who remains well, has been able to appreciate the priceless gift of a continent anus. And because of the preservation of the specimen all doubts about the nature of the original growth have been set at rest by repeated histological examinations. That particular case is of further interest because 13 years ago I also excised a *carcinoma of the hepatic flexure.*

There is a tendency among surgeons to say, or at least to fear, that most cartilaginous tumours or fibrous tumours connected with bone are really malignant, as shown by the subsequent history of the patients on whom radical operations have been carried out. The woman from whom the left half of the mandible was removed for such a tumour (fig. 7) was alive and free from recurrence 31 years later, and a further histological examination confirmed the original report of fibroma with much œdema. (See also fig. 8.)

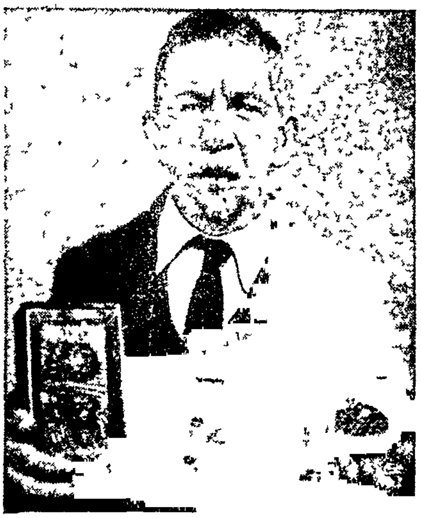

Fig. 7—Excision of jaw and of rectum, in both cases for carcinoma. The patient died at 87 without recurrence 24 years after operation on jaw and 18 after removal of rectum. (Specimen of jaw in left hand and of rectum in right.)

Another idea I want to mention is the value of special but changing exhibits. The restored museum should possess a large demonstration room where special exhibits could be put up from time to time and kept on view for a month or more. The anatomy of approach is somewhat of a new idea, and is intended to display the anatomy of operative incisions.

How often has the novitiate wondered exactly what are the structures encountered and to be divided or thrust aside in carrying out the exposure of the kidney, excision of the rectum, or the exposure of the gasserian ganglion. For each operation a series of special dissections would have to be made and alternative routes of approach would have to be illustrated. I am convinced of the value of such a plan and am most interested to find that it was employed by James Douglas who died in 1742 and whose name is given to the peritoneal pouch. Douglas realised the importance of anatomical knowledge in the practice of surgery and had in his house a complete collection of preparations showing every possible surgical method of reaching the interior of the bladder and the advantages and inconvenience of each method so far as these depended on the structure of the parts.

The section of general pathology should be restored in its entirety and there may be directions in which it could usefully be extended. The old museum contained the most remarkable collection of all sorts of calculi, about a thousand in number, which were classed mostly according to the parts of the body in which they were found. In the future museum considerations of the formation of "calculus disease" might form a thought-provoking section.

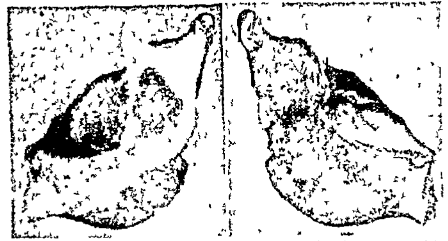

Fig 8—Soft fibroma involving left half of the mandible It was excised in a woman of 45 There was no recurrence and the patient remains well 31 years after operation.

Then there is the idea of illustrative group exhibits in which the ravages of any one disease are shown together irrespective of the regions of the body involved. A medicolegal collection is very badly needed, for there is none of any moment in a public museum. I was much impressed with such a collection which I visited in Buenos Aires where most beautiful wax models were freely used to amplify the exhibits.

Gynæcology and obstetrics were always well repre- [illegible] no difficulty [illegible] them second [illegible] fortunately [illegible] its honorary curator, Sir Frank Colyer, this branch of surgery, which originally owed so much to Hunter, was worthily represented. Each of the special senses must have sections, as in the past. But this must not exclude certain conditions being included in the section of general pathology or elsewhere in the museum if some principle can thereby be the better illustrated.

In view of the well-directed activities of the Wellcome Foundation I think we might properly restrict our histc [illegible] asso[illegible] men [illegible] exhi[illegible] Sect[illegible] sion, and wound treatment will certainly prove useful and interesting. Nor should X rays be excluded from such a museum as we have in mind, and I envisage at least a standard collection of the very best films.

The after-results of operations might form an increasingly fascinating exhibit (fig. 9) Similarly the results of experimental surgery should be recorded by specimens. Further, in order that we may help serious workers to extend knowledge it will be necessary to have a large amount of store material not merely tucked away but easily accessible and properly catalogued or indexed (fig. 10). Facilities should be provided for its close examination even if dissection is necessary. I also have in mind proper study rooms, where those engaged in a particular piece of work can keep their specimens together and can work on them without necessarily having to reassemble their material each day. For some years now there has been much talk in the profession of research, but this has usually been in terms of laboratory work and usually animal experiments. Many people forget how much re- [illegible] for the very many keen young surgeons who are working in and about London: convenience and proximity will not in themselves initiate investigation, but they will do much to encourage it.

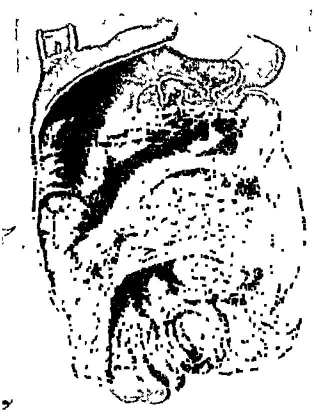

Fig 9—The rectum into which both ureters were transplanted 3½ years before The patient a boy of 10 with total epispadias, died from intestinal obstruction due to mesenteric tuberculosis Until the onset of the fatal illness he was well, with good rectal function and control

We should aim at making our collections the most famous repository in the world; but we must not make the mistake of supposing that other museums have stood still, and we should have information as to what may be going on elsewhere, so that inquirers may be helped by reference to the proper quarter. Here a museum bureau would be very useful. Among other functions this should supply information about collections in other museums in the Empire, in time perhaps throughout the world.

There is so much in prospect that I would like to think that more members of the profession would choose to adopt museum work as a career. Adequate facilities for making use of the particular part of the collections which might be under their care, and for taking part in general scientific activities, should be a sufficient inducement to men of a certain type of mind to devote their lives to such an occupation even if the monetary return was less than in other spheres of professional activity. Perhaps the revival of studentships might be a help and such might be endowed. When we think on these matters it is usual to have in mind the younger members of the profession, but we ought to remember the more senior members who have often been so helpful in the past and who might be glad to [illegible] rs after their active work has come to an end. [illegible] the college for the restoration of the museum and its subsequent upkeep at a very high standard will require a very much larger income; and the time may come when we must expect our fellows, perhaps even our members, to make some sort of annual payment to our funds.

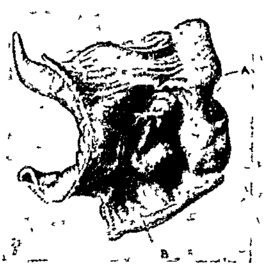

Fig 10—A rare anomaly of small intestine Meckel's diverticulum with similar condition in lumen of bowel A, entrance to internal diverticulum B, entrance Meckel's diverticulum

CONCLUSION

And now a word to my younger hearers who are by far the most important members of this audience. [illegible] when the years hold so [illegible] prospect; but one great [illegible] ncouraging those whose [illegible] re this museum will be [illegible] But it cannot be done without your help, which will be greatly valued by succeeding generations.

You must never forget that what enabled Hunter to put his ideas into practice was his wonderful capacity for work. *That* was the master word in his career.

BEQUEST TO THE LONDON HOSPITAL.—Miss M G Davies has left £10,000 to the hospital in memory of her father, [illegible] brother, Ivor Theophilus [illegible] ating into the minds of [illegible] following sound rules of hygiene, including simple healthy diet, exercise, fresh air, and cleanliness, together with cheerful Christian religious instruction." A department of social and preventive medicine has lately been set up at the hospital

PSYCHIATRIC CASUALTIES
AMONG OFFICERS AND MEN FROM NORMANDY
DISTRIBUTION OF ÆTIOLOGICAL FACTORS

EMANUEL MILLER, MA CAMB., MRCP, DPM
LIEUT.-COLONEL RAMC

To the uncritical observer the reasons for breakdown as a result of the stress of war should present no distinctive features as between men and officers. It is the aim of this paper to show that there are important distinctions which need scrutiny for the purpose of tightening up selection techniques and refining methods of treatment and disposal.

Even before selection boards were instituted it was clear to intuitive judges of men that certain qualities of mind and capacities for action were necessary if a man was to fill the officer rôle, for even admitting that a man is likely to assume leadership in virtue of his special technical equipment for a given arm, there are capacities which will cut across these considerations. The genus officer is not determined by some inborn quality which gives a man membership of an elite but by the possession of a group of gifts which are actuated in a particular situation. Prima facie the officers who landed with their men on the Normandy beaches were a selected body collected either by the old method of interviewing or by the later techniques established by War Office selection boards. Nevertheless the ultimate test was war itself, for until tried in the fire the quality of the metal cannot be fully known.

The ordinary soldier cannot be defined merely as one who does not possess officer quality (i.e., technical equipment to lead and moral equipment to inspire) but as a man who has not been selected so far, and in consequence must remain for the time being in the lower level of the military heirarchy and therefore subject to the emotional imperatives of that level in the military field. The officer is one who while isolated is yet responsible in a most intimate way for the conduct of an operation however small, and bears all responsibility which this operation may entail; for at any moment the smallest operation may be critical to his men and to the larger consequences of a campaign.

The object of this contribution is to study from collected data the differential way in which the capacities and handicaps of men and officers respectively can withstand the impact of military necessities and the conditions of active warfare. By analysis of officer breakdowns consequent on the Normandy campaign it was possible, by subjecting their histories to the same technique as those of other ranks, to estimate in some degree the weight of ætiological factors in the two groups of men.

Within reasonable limits the age-groups were the same, ranging from just under 21 to 35 years, and length of service was similarly distributed throughout the two series. For each group the number who had had prewar experience as serving soldiers or officers was the same. An almost equal number of officers and men had previously seen active service in other theatres of war.

With regard to the physical strains of battle in the first 25 days after the landing, the privations experienced must be regarded as of equal intensity in both groups. The irreducible variables were therefore: (1) the type of precipitating factors; and (2) predispositional factors (table I).

PRECIPITATING FACTORS

The type of weapon experience and the immediate objective effects of enemy fire appear to have been the same in officers and men, although the men seem to have been more conscious of the harassing effects of mortar and shell fire. Officers, on the other hand, being perhaps on the whole more introspective and more conscious of the technique of battle, were more reserved in their statements regarding the unpleasant character of enemy weapons. They tended to analyse their effects on a more technical level without speaking immediately of their emotional effects. However, when officers did speak, or when they were encouraged to speak, about the effect of weapons on themselves it was possible to elicit from them something like the same distaste for mortar

Reactions to actual conditions of battle appear to be influenced by the group rôle which distinguishes officers from men. Men, for example, appear to be much more deeply influenced by the effects of solitude and isolation, particularly by separation from the friends with whom they had, as it were, grown up in service and battle experience. Emotional ties to individuals appear to be much more essential to the well-being of the soldier than to the officer. To the latter, the tie is much more abstract. The soldier, it is true, has his group affiliations which heighten his pride and therefore help to maintain his morale. But it is more of a reciprocal relationship; he gets as much from membership of the group as he gives to the group. The officer however is under obligation *to* the group. He knows that his men rely on him and he less on them, even taking into account the fact that their response to his plans or encouragement is necessary to his carrying out his rôle. Therefore, whereas the soldier breaks down among other things through loss of a specific pal, commonly mentioned by name and with emotion during history-taking, the officer breaks down because of the feeling of loss of power to exhibit his responsibility. The figures in table I show this to a remarkable degree, and even where NCOs are conscious of their responsibility it does not seem to weigh on them so heavily because of their apparently closer emotional contact with the men.

This clearly signifies something important in the selection of officers. It seems to mean that in preselection the officer candidate must be judged not solely by his capacity for group coöperativeness, for his capacity to form healthy emotional ties to his men and colleagues, but for his capacity to rise above these ties and to maintain some measure of independence and objectivity—indeed, to take his responsibility almost as an abstract virtue, in which some degree of controlled disregard for others may prove to be a necessary ingredient. There may be a point where compassion too deeply felt may militate against his officer rôle.

Responsibility, as case-histories show, is not a simple endowment but composed of many ingredients. It is tied up with technical knowledge and intelligent understanding of that knowledge and its utilisation, a sense of the well-being of others, and, above all, an awareness of one's own integrity as a leader of others. The problem of the officer, as clarified by case-histories, is a dual one. He is obliged to divide his attention, and even more his emotional organisation, between self-preservation on the one hand and responsibility on the other. He must be able to endure this perhaps only temporary dichotomy to a greater degree than is necessary in other ranks. However much we can concede that the private has his sense of duty relating him to his fellows, the more intimate interpersonal ties are not to the same degree complicated by such quasi-abstract considerations as organising a party of men for action, keeping up their courage and sense of urgency, and other imponderable cognitive and emotional aspects of leadership. These latter demands are what put a particular strain on the officer; for he is obliged to maintain high-level awareness on a multitude of issues. The soldier is allowed, as it were, to react on a more primitive level, showing at such a level a primitive awareness of danger and opportunity for offensiveness. To the soldier his supports are his pals, whose example of endurance alongside him is a spur and a comfort. The officer must often rise above this.

This point may help us in making decisions, particularly with regard to the therapy of officer psychiatric cases. It appears that rehabilitation for officers should start very early; and officer patients, if once evacuated, should be given every opportunity to resume at an early date the officer rôle, and practice in responsible leadership should be an essential part of any therapeutic regime over and above individual therapy by sedation, abreaction, and resynthesis of war experiences. Wherever a hospital has a rehabilitation wing it should be possible for officer patients to participate in the exercises of men who have suffered similar disabilities, having practice in organising working parties and paramilitary exercises under the guidance of combatant officers. These latter should by preference be chosen for their knowledge of the technique of officers-selection; officers who have the insight derived from special military testing and judgment in should therefore prove the be the rehabilita- tion of psyc with the psychiatrist who knows each officer's psychopathology may prove a valuable team technique in rehabilitation.

DIFFERENTIATION OF CLINICAL TYPES

With regard to clinical types, both in officers and in men the manifestations of breakdown were significantly different from those of the last war. Hysteria, where manifest, rarely took the form of those gross locomotor disturbances seen in the last war. Paraplegia, pseudoparesis of arm and hand, with the bizarre deformities described by Babinski and Lhermitte, have been rare in this campaign. The tremor and unsteady gait, however, typify the effects of immediate panic or horror rather than deep cleavages in psychophysical structure, which were classical forms in 1914–18. No doubt in that campaign the long weeks and months of a war of attrition provided that period of meditation which allowed for deeper cleavages in the mind. This may account for the rapid recovery of so many men in this campaign, aided by early sedation and reassurance in the near-battle zone. Furth large numbers of men of low service obviated the product elemental type of psychic cleavage.

The amnesias in this war were much more patchy, less profound, and more amenable to resolution by the simplest therapeutic techniques. It may well be that many such cases were seen by us some days after evacuation and after some measure of sedation had been administered and were already "softened up." Periods of loss of memory had little time to become encapsulated and therefore intractable to any procedures less than hypnosis or narco-analysis ('Pentothal' induction). It would be interesting to discover from advanced area psychiatrists how many neurotic casualties with or without strong neurotic predisposition were satisfactorily sent back to full duty after a few days' rest at field dressing stations or exhaustion centres.

TABLE I—DISTRIBUTION OF FACTORS IN 57 NORMANDY PSYCHIATRIC CASES

	Other ranks (28*)	Officers (29†)
(a) Age (yr.)		
—21	6	2
22–26	10	6
27–30	8	12
31–35	4	4
35 +	0	5
(b) State		
Married	15	22
Separated	1	0
Single	12	7
(c) Length of service		
1–3 yr.	13	4
3–4 yr.	8	11
5 yr. +	7	14
(d) Enlistment		
Regular	7	..
Volunteers (TA)	3	.
Army class	18	.
(e) Diagnosis		
Anxiety:		
Depressive	6	7
Confusional	1	3‡
Hysteria:		
Visceral	1	1
Motor	6	5
Sensory	14	4
Amnesic	4	9
(f) 1st evac. as casualty		
1st week	8	3
2nd–4th weeks	20	10
After 4th week	..	16
(g) Type of warfare at breakdown		
Defence	17	10
Attack	9	11
Not clear	2	8
(h) Precipitating causes		
Type of weapon most complained of:		
Mortar	10	4
Shell	10	7
Bomb	2	1
Sniper	2	0
Own barrage	1	0
Doubtful	3	17
Other causes		
Death of a comrade	7	0
Heavy casualties	5	4
Exhaustion and privation	1	2
Illness	0	1
Change of unit	0	2
Near explosion	0	5
Recent domestic stress	5	0
Overwhelming sense of responsibility	1	12
Sense of isolation	0	1
(i) Predisposing factors		
1. Unfavourable environment in first 10 years of life	14	8
2. Previous personality adduced from life history and self-estimate:		
Cheerful (syntonic)	5	11
Solitary	13	5
	6	8
	2	1
	3	3
3	19§	18‖
4. Dependency attitude with no neurosis or clear character deviation	2	2
5. Morale level before D-day		
Keen	6	13
Compliant	14	11
Resentful	3	[illegible]
Doubtful	5	5
revious battle experience	8	6

* 7 NCOs, 21 privates.
† 1 lieut.-colonel, 3 majors, 4 captains, 21 lieutenants.
‡ 1 postconcussional.
§ 13 neurotic breakdowns.
‖ 12 neurotic breakdowns.

TABLE II—REACTION TYPES IN OFFICERS AND MEN

Reaction type	Officers	Men
Anxious, timid, over-dependent	2	0
Over-aggressive	2	0
Deep seated conflict, over aggression	8	6
Emotionally unstable	7	6
Apparently normal	10	7
Totals	29	28

"Exhaustion" can only be a refuge for timorous diagnosis if it remains attached to a man after he has passed through the hands of a officers or men complair (physiologically) "whac able to describe states of incessant mortaring an dark. Most men describe the state in such terms as: "I couldn't stick it any longer." "The noise got me down." "You never knew where they'd land." "Jerry was always trying something new." Officers, however, would add: "I couldn't keep touch." "I didn't seem able to lead any more." "Very often you didn't quite know whether you were going forward or back." "An 'offence' and 'defence' were meaningless distinctions." "It wasn't what I expected battle to be." "There was no front line anywhere." These remarks typify the state of mental confusion, the mother of emotional despair over and above the physical strain and stress. One officer, who was blown up and remained for a time wedged upside down in his tank, complained on waking from a short period of unconsciousness that he was more distressed by his powerlessness to do anything in self-defence than by any sense of physical exhaustion. ly some men recover from such yet how slowly others would of bombardment not always entailing immediate danger.

PREDISPOSITIONAL FACTORS

As will be noted from table I, the presence of neurosis and clear-cut character deviation in pre-war days was equally divided between officers and men. But in the men unfavourable environmental circumstances of a gross kind in early life were clearly a commoner factor in men than in officers. As can be seen from table II the basic reaction types are evenly distributed as between officers and other ranks. Solitariness of disposition was found much more often in men than in officers, which suggests that the capacity to form widely distributed This should relationships ie preselection diagnosis. The following is an example of breakdown in group relationships of an otherwise excellent officer.

Major X, age 27, a regular officer who entered Sandhurst in 1936, where he did well in studies and games. He served with distinction in N. Africa and Sicily when he received the MC. After an active battle period of 9 months he went to France on the day after D-day. He alleges that all his party were pretty exhausted with pre-invasion exercises before landing. For a time his unit was isolated and in the waiting period for a second advance he became apprehensive; later in a small engagement he broke down when a personal friend was killed near him. He repeatedly said that he could never keep going again unless he were back with his old unit and his personal affiliations. He can no longer tolerate discipline and alleged that without the support of his old friends he would never be of use again. This makes him depressed, irritable, and most intolerant of discipline. "When we were all together discipline didn't seem to matter." Always a cheerful sociable type with a bent for amateur theatricals, he had at one time contemplated going on the stage. While at school he had hoped to go to Dartmouth to keep up a family naval tradition. An apparently subsidiary problem has been his engagement and eagerness to get married before going into action again. This has been a great preoccupation, and from his description of his fiancée it appears she is a strong character on whom he leans very much.

This was an overtly normal person with a good soldierly disposition engendered largely by his ideal to maintain the high Service tradition of his family. Fundamentally he was a very dependent type who must receive the support of others to carry on. He did exceptionally well with fairly superficial psychotherapy lasting 3 weeks. He was then getting married and prepared to go back to full duty. A rehabilitation period as an instructor at OCTU was recommended.

Another example illustrates the problem of lack of power to hold responsibility in men with high initial morale but with small powers of resistance.

Lieutenant X, age 21, single. Enlisted September, 1941, when aged 18, and got his commission through selection board. Did not do too well at OCTU but passed out in average grade. Landed in Normandy on D 41 and was changed to another unit, much to his disgust. Under shellfire but not in attack at first. Did not like early bombing and machine-gunning but received great support from an ex-policeman NCO. He found his unit in low spirits when he joined them as they had been having a rough time holding a defensive position. This jumpiness affected him and he did not feel he had the capacity to pep them up. Had to hold a position for 5 weeks, but developing a philosophic resignation he was able to lead his men in a subsequent attack. In tank attacks he began to feel his leadership capacity waning and he confessed to making serious errors of judgment. These appear to have been exaggerated and were based on too high an ideal of his rôle. Felt the sufferings of his men were due to his ineptitude. "I couldn't hold down the job if I went out again." For a week he was depressed, irritable, and rather self-accusatory. Wanted to fight his battle out and refused sedatives. He welcomed psychological interviews and became very communicative. His attitude was deeply involved with his attitude towards his mother. An only son who feels he cannot abandon her. Alleges that in Normandy thoughts of her were a constant preoccupation. "I always wanted to do things on my own but mother constantly stood in my way." "This made me angry with her as I wanted to prove myself. I haven't done so and can't face up to leaving others." After 5 therapeutic sessions he made good improvement and was discharged category B for 3 months. Has now much more insight and self-reliance. Does not think his mother worries as much about him as he thought.

SERVICE IN THE EAST

Comparing a group of officers who served only in Normandy with a group who served in the Mediterranean and eastern theatres of war some instructive differences emerged. In the latter group the men were frequently subjected to the debilitating effects of tropical diseases—malaria, dysentery, &c.—to which organic stresses one must add the stress of contact with alien peoples and environments. Wherever they fought, men were subjected not only to the threat of the enemy as a visible aggressor but to the threat of the unseen invaders, the malaria parasite, &c. But above all, and round about, the new and not so romantic scene of strange countries, customs, and ideals. This has come out with clarity with carefully taken histories. The officers in particular, largely by education (or the lack of it) and social affiliations, appear to have had no preparatory concepts regarding the world they would be obliged to live in and to some extent share. The men by and large took a more matter-of-fact—indeed, ribald—attitude towards natives and their countries, and were more prepared on the whole to accept the rough life wherever it was to be found. They were less critical of the social environment of India, Burma, or Abyssinia, and perhaps were less outraged by differences of custom and social forms.

Does not this suggest that wherever possible officers ticular should be carefully briefed with regard to the social structure and modes of the people among whom they are to work? Intellectual curiosity may go a long way to paving the way to understanding and sympathy and should engender in them the capacity to tolerate strangeness as well as hardship. Those destined to serve in Burma should see in the Japanese not merely "yellow devils," a concept which arouses infantile dread, but a people with a culture of a different kind, with a political outlook alien and abhorrent to us, but not merely the possessors of a physique which, unamiable as it may be, is an irrelevance at most, and productive of destructive fears.

Men serving in the east have enough to bear from heat and pestilence without burdening them with a load of cultural ignorance which isolates them from their environment, intensifies nostalgia, and thereby materially lowers morale. Indeed, for very obvious reasons nostalgia and a pining for the familial and the familiar is an important obstacle to adjustment. Terms of service abroad are longer, and chances of leave, except to the local base, are negligible. Wounds or breakdown due to mental and physical sickness are treated at base hospitals in the local command, whereas in the western theatre there is the feeling that home, if not reached for long stretches of time, lies only across a narrow sea.

SUMMARY

A series of cases of psychiatric breakdown among officers and men from Normandy is analysed for type and period of breakdown, and outstanding ætiological factors. All cases were observed for periods ranging from 4 to 8 weeks.

Diagnostic differences were not outstanding in any way. The alleged predominance of hysteria in men was not substantiated.

Officers tended to break down later than men.

Domestic stress was more commonly present as a background factor in men than in officers.

Sense of responsibility appeared to be much the most potent factor in breakdown among officers. In the men group affiliation and the loss of comrades have a most potent effect: they appeared to be more solitary than officers, less able to form new group affiliations, and therefore less able to suffer mental trauma.

Officers seem less capable than men of adjusting themselves to alien surroundings. Before serving abroad—particularly in the East—officers should be taught something of the social customs of the civilian population they are to encounter.

REPAIR OF PERFORATING CORNEAL WOUNDS

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OPHTHALMOLOGIST, EMS

THE treatment of corneal wounds rests on two methods —(1) covering the wound with a raised flap of conjunctiva, and (2) direct suture. The former is more generally used (Goulden and Whiting[1]), while the latter is perhaps gaining ground. This is a report of a personal series of 34 cases treated by suture.

The aim of surgery is to save any eye which can be made safe and useful, not to retain those which are useless and disorganised; they are better excised, saving weeks of illness and great disappointment. It is unjustifiable to run any risk of sympathetic ophthalmia for an eye which will never see. The routine use of penicillin may result in the retention of a greater number of such eyes, and some of these are likely to be subject to recurrent inflammation.

This series is confined to cases without retained foreign bodies. Nor does it include minor perforations for which no operation was needed; these are common, have a good prognosis, and their treatment is not in doubt. The cases are divided according to whether or not there was a traumatic cataract, as this is the point of greatest importance in prognosis. All except 4 required abscission of uveal prolapse. All had sulphathiazole, but no penicillin.

In the cataractous series of 15 cases, 7 were excised, 4 for infection and 3 because they remained irritable.

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1. Goulden, C. B., Whiting, M. H. Surgery of Modern Warfare, Edinburgh (edited by Hamilton Bailey), 1944, p. 823.

Of the others, 7 had at least good projection of light, and expectation of reasonable aphakic vision. The remaining patient developed a severe corneal ulcer and had no useful vision; he will be mentioned again. Most cases had one or two sutures; 6 required three sutures, and 2 of these eyes were retained, though both had severe corneal scarring and excision might have been better treatment. The only reason for keeping such severely damaged aphakic eyes is the remote chance of loss of the good eye by accident later. The little blurred vision they give is often a nuisance, and although the patients are always grateful that their eyes have been "saved," not infrequently they change their minds later and are sorry that an excision was not performed.

In the 10 cases with intact lenses, 1 eye was lost from infection; 5 had vision of 6/6–6/9, 0 vision of 6/12–6/18, and 2 vision of 6/60; 1 had a dislocated lens and vitreous hæmorrhage; and the last was a young child whose vision was not taken. So 14 of the 19 patients had at least reading vision. In this series three sutures were used on four occasions, and all the eyes retained; 2 at least of these cases were successful, having visions of 6/12 and 6/18.

Although small, these figures do illustrate the influence of lens damage on the prognosis. Delay in attending hospital does not appear to make any difference to the outlook, because it occurs chiefly in the less severe cases. Three cases waited for four days before attending, and 2 of the eyes survived, one with vision of 6/6 after abscission of iris prolapse and wound suture.

Causes of the injuries were various. Industrial accidents, household accidents, darts, arrows, and wood-chopping by bad technique were the most frequent. Four were from flying glass; none of these eyes had cataracts and all were retained. Of 3 due to broken spectacles, one had a vitreous hæmorrhage but the other 2 were left with reading vision.

Repair by conjunctival flap.—A consecutive and unselected series of similar cases treated in other hands by conjunctiv [illegible] 's, but a very large [illegible] in order to judge t [illegible] tistically. The conju [illegible] 34 cases. Of 15 cataractous eyes, 9 were excised, 3 showed poor projection of light because of vitreous hæmorrhage or detached retina; 3 offered hope of improved aphakic vision. Of 19 cases with undamaged lenses, 5 were excised, 9 had reading vision of 6/18 or better, and 5 worse than this.

TECHNIQUE OF CORNEAL SUTURE

Perfect conditions are required for corneal suture. With [illegible] simple; other [illegible] l results canno [illegible] nder full control and cooperative, general anæsthesia (especially 'Pentothal') is advisable. [illegible] lamp is useless, an inten [illegible] Lister's lamp is the best. [illegible] cessfully used an ordinary headlamp, but the voltage must be increased to a point at which the bulb is soon burnt out.

Whether a binocular loupe should be used depends on the surgeon's preference and accommodation. Eyeless atraumatic needles and waxed silk are improvements on the technique here described; they were not however used in any of these cases and are not essential.

The wound lip is held by a straight toothed iris forceps, and a suture of black (being easier to remove later than white) 00 silk on a Maddox needle is passed through the superficial edge. The suture does not enter the anterior chamber; after taking up both lips of the wound it is tied firmly and cut very short. The sutures are placed so that their minute scars will not interfere with central vision, and as few as will obtain accurate apposition are used. It is usually better to abscise any uveal prolapse before inserting the sutures, as loose threads will be in the way, but occasionally, if a vitreous prolapse threatens, they may be inserted before the abscission and tied afterwards. It is most important to avoid any pressure on the globe during the operation; this requires great care, or vitreous may be lost.

After 8 or 10 days the stitches are removed. With a proper light this may usually be done in the ward, otherwise the patient is taken to the theatre. It must be explained to him that this is not another operation, and he should by this time have sufficient confidence in the surgeon to believe him and not be unduly anxious. Young children will however require a short general anæsthetic, which is a disadvantage.

It is not claimed that there is anything new in this method, which was described and advocated by Praun,[2] who gives a reference to its description by Dieffenbach in 1847.

CONJUNCTIVAL FLAP OR SUTURE?

The technique of a conjunctival flap will be found elsewhere (Goulden and Whiting).[1] Its aims are: (1) to close the wound; (2) to c [illegible] infection; and (3) to provide [illegible] tissue to aid repair. Many w [illegible] nder their flap. This is especially likely during the anxious early postoperative period in response to any external pressure on the eye. Delayed healing and further prolapses may result. Covering of an open wound by conjunctiva is [illegible] ice of infection; [illegible] eye, where late [illegible] traction of the [illegible] ss of the eye is [illegible]: if retraction is early it may occur before the wound is healed. Both these complications occur. The wounded cornea is perfectly well able to heal without being covered by conjunctiva, as is seen best in Tudor Thomas's operation for corneal grafting. The essential is that there shall be firm and accurate apposition of the wound edges. [illegible]

[illegible] this is especially so when the flap has left behind tags [illegible]

[illegible] wound would have given a firmly healed scar, less astigmatism, and no risk of [illegible].

It has been objected [illegible]. Given proper conditions for [illegible], this is not so. Many surgeons use corneal sutures constantly in cataract extraction. With sutures the wound edges are firmly closed and held so. This achieves healing in the shortest time with minimal scarring; it is, after all, the method used everywhere else in the body. Closure of the wound is the surest way to keep out secondary infection, and the rapidity with which the wound becomes watertight is seen by the recovery of the anterior chamber. Rapid recovery of the anterior chamber reduces the incidence of anterior synechiæ, and this has an important bearing on prognosis, the eye settling more quickly and requiring fewer subsequent operations. Inflammation being minimal, the patient is comfortable with a sutured eye, and it is easy to assess its progress.

In this series of 34 cases there was no infection of the stitch site. One patient did develop a severe conjunctivitis and a corneal ulcer, but it was neither in the wound nor the stitch site, although the stitch was still in place. This is important, as corneal sutures are often accused of inducing corneal infection; they may become infected, but it is very uncommon.

In a restless patient, or one who has to be moved soon after operation, the sutured wound is very secure and allows greater freedom than can be permitted with a flap, but there are some wounds which cannot be properly sutured, such as those with ragged edges, some with œdematous edges (where there has been delay), and others which show loss of corneal substance; these must be treated by flaps.

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[2] Praun, E. Die Verletzungen des Auges, Wiesbaden, 1899, p. 179.

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PENICILLIN IN GONORRHŒA

SUGGESTED SCHEME OF TREATMENT

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With a postscript by
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SURGEON VICE-ADMIRAL, MEDICAL DIRECTOR-GENERAL

DIFFERING schemes have been suggested for the treatment of gonorrhœa with penicillin, and in the main the tendency is towards a long "time-spread," up to forty-eight hours or more, with a dose of penicillin up to 20,000 units per injection at varying intervals, with a total of from 100,000 to 150,000 units. This type of treatment, with its small fluctuating low level of penicillin in the body over a long period, is successful in many cases, but it seems to us unnecessary and extravagant in "man-hours," now so vitally important. Using trial doses of penicillin controlled by slide, culture, and blood-serum inhibition levels, we have evolved a scheme of treatment which is more economical in time and labour, and does not necessitate admitting the patient to hospital.

Using the hæmolytic streptococcus technique described by Sir Alexander Fleming (1944) to estimate the bacteriostatic effect of the patient's serum, we carried out a series of experiments to determine (*a*) the minimum dose of penicillin required to give an adequate bacteriostatic effect against the gonococcus, (*b*) the frequency with which a dose of penicillin had to be repeated to maintain an adequate bacteriostatic level in the patient's serum, (*c*) the minimum time such a level need be maintained to give an optimum cure rate. Our laboratory work combined with our clinical experience suggests that unless "serum inhibition" was present in a serum dilution of not less than one in eight, and was maintained for 9½ hours, the high rate of cure which we expected was not obtained.

In the table the dosage and results obtained, when using six different courses of penicillin injections, are contrasted with the standard or routine course finally adopted (bottom line of table). Figs. 1–7 are graphs of the bacteriostatic titre in the patients' blood-serum plotted against the time elapsing from the first dose of *penicillin. These graphs correspond to the seven courses* as indicated in the table. They were made from single controlled cases or were averages of a number of controlled cases, as indicated on the figures.

It is clear that all the courses of penicillin were capable of maintaining the bacteriostatic titre above a serum-dilution of 1 : 8, but the table and the graphs together demonstrate that relapses, irrespective of size of dose and the intervals between them, were relatively frequent in those courses in which the titre of 1 : 8 was not maintained for over 8 hours. On the other hand, fig. 1 (based on 40 controlled cases) indicates that when the titre was maintained at 1 : 8 for over 9 hours, relapses practically disappeared (see bottom line of table).

This is a remarkable observation, when the great variability which is generally exhibited by the complex biological interactions between host, parasite, and specific drug is considered, because, in the special series of case in question, the mere addition of 2 hours and 30,000 units of penicillin (see figs. 1 and 4) to a course of treatment was followed by a reduction of the number of relapses from 6 in 25 to 1 in 265 (see table).

Recent work by Romanski and Rittman (1944) with peanut oil and beeswax to delay the absorption of penicillin, and by Beyer, Woodward et al. (1944) with *para*-aminohippuric acid to delay its excretion, may radically alter present ideas of treatment. We have carried out experiments with penicillin incorporated in different vehicles but our results so far have been inconclusive, and until other methods have proved superior our routine scheme of treatment will be retained. This course has cured 265 unselected cases of gonorrhœa with only one relapse and will be adopted as the standard treatment for gonorrhœa in the Royal Navy.

Scheme of treatment.—30,000 units dissolved in 1·5 c.cm. of pyrogen-free sterile distilled water was injected intramuscularly or deeply subcutaneously at two-hourly intervals for five doses—i.e., 150,000 units in eight hours.

Selection of cases.—In this series the cases were unselected. Every case sent to our establishment for treatment over the trial period was treated in this way.

RESULTS OBTAINED WITH DIFFERENT DOSAGES OF PENICILLIN AND (BOTTOM LINE) WITH THE ROUTINE COURSE ADOPTED

Dosage (units IM)	No. of cases	Relapses	Average days to relapse	Total amount of penicillin	Blood curve.
20,000 hrly × 5	6	1	2	units 100,000	Fig. 2
30,000 hrly × 5	81	6	5	150,000	Fig. 3
30,000 two-hrly × 4	25	6	5	120,000	Fig. 4
50,000 half-hrly × 3	6	2	2	150,000	Fig. 5
50,000 hrly × 3	15	3	2	150,000	Fig. 6
75,000 hrly × 2	6	1	1	150,000	Fig. 7
30,000 two-hrly × 5	265	1	2	150,000	Fig. 1

IM = Intramuscular injection.

The gonococcus was demonstrated in every case before beginning treatment. Of the first 200 cases treated by the scheme, 26 were sulphonamide-resistant; 9 were failures or relapses from other schemes of penicillin treatment; 7 were chronic prostatic infections having had their discharge for periods ranging from 3 weeks to 5 months; 6 were having 'Mapharside' and bismuth for concurrent syphilis; and 1 was having neoarsphenamine.

Tests of cure.—Patients were given urethral and prostatic smears and cultures 48 hours after treatment (by this time the blood-serum and urine are penicillin-free), and a week, a month, and 2 months after treatment. This was the ideal aimed at and set as our standard of cure, but the drafting arrangements of the Service have necessarily interfered with this procedure in some cases; in spite of this 48% of cases have completed this supervision, 15% six weeks' supervision, and 27% are still under surveillance.

RESULTS

Of the 265 cases treated to date in this series, one only (no. 140) has failed to respond to the course of penicillin. This was a case of anterior urethritis and no reason for the failure could be found. The penicillin could not have been at fault, for the batch was in general use at the time; the penicillin required for the treatment of all cases that day was made up in solution in bulk and the other cases treated the same day responded satisfactorily. Forty-eight hours after initial treatment the patient had a very slight discharge in which smears and cultures proved positive. He was then given a second similar course of treatment and cleared up without incident, showing that the gonorrhœa was not "penicillin-resistant." The failure must be ascribed to some undetermined personal factor.

Two cases of acute epididymitis complicating gonorrhœa were among the series. These were gonococcus-negative to smear and culture after the penicillin treatment, but one could not claim that the condition of the testicle responded more rapidly than it would have done with other forms of treatment. Failures from previous courses of penicillin treatment given elsewhere, and the cases of chronic prostatic gonorrhœa, all responded satisfactorily. Sulphonamide-resistance has made no difference whatever in the response to penicillin. In our series no case developed any form of complication after

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Continued from previous page

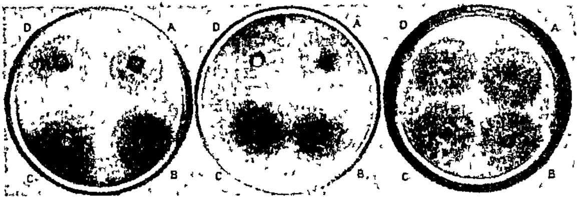
DR. CRAWFORD: SUMMARY

A personal series of 34 perforating wounds of the cornea, without retained foreign body, were treated by corneal suture.

The prognosis is seen to rest largely on the occurrence [illegible] ct. The technique of corneal suture is des- [illegible] the method compared with that using a [illegible] al flap.

the commencement of treatment, and no case of *Ps. pyocyanea* infection has been observed.

For one, two, or more days after completion of the penicillin course, threads or haze were present in the patients' urine, with perhaps a slight mucoid urethral discharge. This is considered a postinflammatory condition and should not be regarded in any way as indicating failure unless proved by smear and culture. One can compare this to the residual inflammation in an eye from which a foreign body has been removed. Further local treatment (e.g., irrigations) may be necessary in some of these cases; only 6 of our first 200 cases had to have this additional treatment.



Mapharside Neoarsphenamine Bisoxyl

Fig. 8—Cylinder plate experiments with *Staph. aureus* to show in-vitro action of penicillin combined with arsenical and bismuth preparations. Each cylinder contained penicillin solution, 5 units per c cm. A, B, and C also contained the arsenical or bismuth preparation: A 10%, B 30%, and C 50%.

minutes from the commencement of treatment in those cases which subsequently passed our test of cure.

Three cases of acute gonorrhœa in women, not included in the above figures, were treated by this scheme. Two have passed their tests of cure and the third is probably cured and is still under surveillance.

Syphilis accompanying gonorrhœa.—The importance of thorough dark-ground examination of serum for treponemata from any possible syphilitic lesion before commencing treatment with penicillin cannot be overemphasised. Van Slyko and Steinberg (1944) describe two cases of gonorrhœa with penile sores treated with 125,000 units of penicillin intramuscularly in 24 hours. Dark-ground examinations were not made until after the penicillin treatment for gonorrhœa was completed,
and then we r *Treponema palli-*
dum, but s at first, became
positive aft ies one case had a
gonococcal ore in which the
T. pallidum was present. He was treated for gonorrhœa by our scheme before commencing antisyphilitic treatment, and dark-ground examinations revealed no spirochætes 11 hours from the commencement of treatment, and were still negative at 21 hours, when he began his antisyphilitic treatment.

Four cases developed primary chancres, one at 3, two at 4, and one at 7 weeks after treatment of their gonorrhœa, the double infection having been contracted apparently at the same time. In these cases the dark-ground examination was positive for *T. pallidum*.

A Wassermann reaction and Kahn test are done on every case before treatment and is repeated with the final test of cure.

USE OF PENICILLIN WITH BISMUTH AND ARSENIC PREPARATIONS

It has been stated that heavy metals may interfere with the bacteriostatic action of penicillin, so we deemed it important to decide what effect, if any, arsenic and bismuth preparations had. We conducted a series of in-vivo and in-vitro experiments to determine this.

In-vitro experiments (fig. 8).

Expt. 1.—To a solution of penicillin containing 5 units per c.cm. was added (*A*) 10%, (*B*) 30%, and (*C*) 50% mapharside by weight: (*D*) was the control, containing penicillin only. These solutions were maintained at 37° C for 30 minutes before being employed in the test. Using the cylinder plate method (Heatley 1944) with *Staph. aureus* (Oxford strain) on an agar plate, (*A*) and (*B*) showed the same zone of inhibition as the control (*D*), (*C*) showed a slightly reduced zone. The plates were read after 20 hours' incubation at 37° C.

Expt. 2.—The first experiment was repeated with neoarsphenamine. The 50% solution (*C*) showed a slightly reduced zone when compared with the control (*D*).

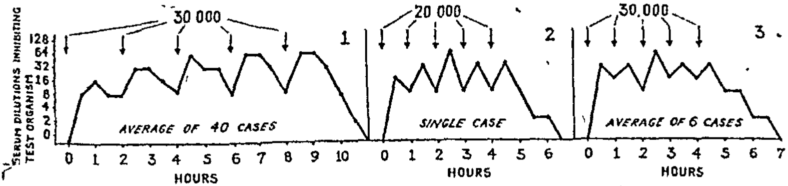
Expt. 3.—Using 'Bisoxyl' (bismuth oxychloride 10%), and the same conditions as in the previous two experiments, no inhibitory effect on the action of the penicillin solution was observed.

It must be realised that the ratio of these preparations to penicillin used in the three experiments is much greater than could possibly occur in vivo using therapeutic doses.

In-vivo experiments.

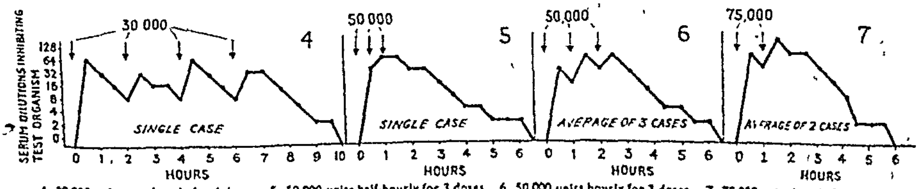
Expt. 1.—A patient was given 0·04 g. of mapharside with a standard (30,000 units two-hourly × 5) penicillin course; the mapharside being given with the second injection of penicillin.

Expt. 2.—A second patient was given 0·45 g. of neoarsphenamine with the second injection of penicillin in a standard unit course.



1 30 000 units two-hourly for 5 doses 2 20 000 units hourly for 5 doses 3 30 000 units hourly for 5 doses

Figs 1–7 Bacteriostatic levels in blood-serum during penicillin treatment with different dosages given intramuscularly.



4 30,000 units two hourly for 4 doses 5. 50,000 units half-hourly for 3 doses 6 50 000 units hourly for 3 doses. 7. 75,000 units hourly for 2 doses

Expt. 3.—A third patient was given 2 c.cm. of bisoxyl with the second injection of penicillin in a standard course.

Blood samples were taken at half-hourly intervals, and, using the hæmolytic streptococcus technique as before, serial dilutions of serum were made and the dilutions capable of inhibiting the test organism estimated and graphed. These were identical to fig. 1 (the control).

Clinically, 6 cases in the series were under treatment with mapharside and bismuth, and one with neoarsphenamine and bismuth. All these cases responded normally to the penicillin treatment of their gonorrhœa.

The above evidence is suggestive that neither mapharside, neoarsphenamine, nor bisoxyl in therapeutic doses has any inhibitory effect on the action of penicillin. The synergic effect which some writers have suggested that arsenicals may have in penicillin treatment is neither confirmed nor refuted by these observations.

SUMMARY

We have presented an eight-hour scheme for the treatment of gonorrhœa which has cured over 99% of a series of 265 consecutive cases.

Sulphonamide-resistance or the duration of infection did not appear to have any effect on the response to penicillin.

With the tests of cure carried out in this series, the possibility of asymptomatic carriers following this treatment of gonorrhœa with penicillin appears to be negligible.

Concomitant arsenic and bismuth therapy is not a contra-indication to the use of penicillin in the treatment of gonorrhœa.

We wish to thank Sir Alexander Fleming for his advice, and the Chief Petty Officers and staff for their coöperation in this work.

Postscript (Sir SHELDON DUDLEY)

The advantages of this routine treatment of gonorrhœa to naval medical administration are immense. It means that, if a man reports in the sick bay at 8 o'clock in the morning he will be discharged to duty at 4 o'clock the same afternoon. He is thus treated and cured in his own ship or place of duty within the working hours of one day. Seeing that before the war it took on the average about 50 days to cure a patient suffering from gonorrhœa, the economy in man-hours and sick-beds is overwhelming. The special benefits of a course of penicillin injections which does not extend over a night is the avoidance of all hospitalisation, a resulting economy in night-duty staff, ambulance transport, bedding, paper work, and delay in starting treatment, besides the often unavoidable delay and difficulty in getting a man in or out of hospital from or to his ship.

In future gonorrhœa should cause far less trouble and disability in the Royal Navy than the common cold.

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AIR EVACUATION OF CASUALTIES.—In the past 2½ years about 800,000 sick and wounded patients of the American and Allied Armed Forces have been carried in American army planes. The death-rate in flight has been 0·005%. In 1944 one out of every five American war casualties returning to the United States went by air. Military strategists, it is stated, prepare for the prompt removal of the wounded from the battlefields as a tactical necessity.

BRITISH COUNCIL.—Prof. James Mackintosh, dean of the London School of Hygiene, is visiting Sweden to lecture for the council on housing, nutrition, and other aspects of social medicine and health education in Britain. He will probably also visit Finland. Professor Mackintosh hopes to obtain in Sweden information for inclusion in a on housing which he is preparing for the British

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REHABILITATION IN A NAVAL HOSPITAL

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THE recent advances in 'rehabilitation' treatment, besides its christening—if this is an advance—have been mainly in the direction of (*a*) healthy, if perhaps too exclusive, insistence on its most important component—namely, active exercise; (*b*) a revival of interest in the application of graduated mechanical load; (*c*) better appreciation of the value and limitations of remedial games; (*d*) improved assessment of results in terms of functional activity, particularly muscle power, coördination, and resistance to stress; and (*e*) the share taken in countering physical and mental deterioration in hospital—i.e., in the maintenance of morale.

Too much must not be asked of "rehabilitation." No amount of rehabilitation treatment will retrieve bad surgery. Nor will it often supplant surgery; patients are sometimes sent to rehabilitation centres to struggle against impediments which would respond to surgery and to nothing else. Although rehabilitation activities may assist diagnosis in selected cases by promoting signs and symptoms, in general the "rehabilitation" of undiagnosed or wrongly diagnosed patients is useless or harmful.

A patient made poor progress after the removal of a normal meniscus from his knee; no amount of effort seemed to restore the quadriceps. He was spurred on to greater efforts; he was sent to rehabilitation centres; all failed and he was sent back to his unit to get on as best he could, branded as one who would not try hard enough. He had wasting, shortening, and coldness of the whole limb and homolateral pes cavus—evidence of an old infantile paralysis in a limb which no amount of flogging could restore.

Nothing delays recovery more than over-haste. Though disability periods can be minimised by good rehabilitation the record-breakers are those who send their patients back to duty unfit. In some hospitals more of the patients' time is lost by bad organisation than can ever be made up by rehabilitation. The other side of the picture is that return to work after trivial injuries has been delayed by rehabilitation—I was once asked by a patient to postpone his discharge so that he could finish his rug!

The purpose of a Service hospital at home in wartime is to restore as many men and women as possible to duty in the best possible condition in the shortest reasonable time. Patients who can never be made fit for useful service are much better treated in a civilian hospital. The time factor is important, but is wholly secondary to the qualitative factor. The essential thing is that the man should return to duty fit—alert, nimble, and capable of endurance.

In common with the other Services, the Navy in wartime is composed, for the most part, of "civilians in uniform." Nearly all would be much better paid, much safer, much more comfortable, and much happier about the future, if in "civvy street." Thus in the Navy, as in the other Services, there is a great temptation to be ill, or to use illness as a means of escape. It is greatly to the credit of the Service that so few, relatively, make use of the opportunities which illness offers. None the less, it is asking for trouble to take the genuinely ill man—with his judgment warped by illness—and practically take him out of the Service, place him in a civilian hospital, mix him with those who will go home to jobs worth £6 a week, and expect him to get well as quickly as possible. Most do, but it is asking too much of the weaker vessels. Consequently, Service hospitals start with a substantial advantage over civilian hospitals.

The Navy has succeeded little or no better than the other Services in the difficult problem of rehabilitating patients by suitable duties at depots and bases. Something has been achieved at some of the smaller ones through the keenness of individual medical officers, but the big depots under present conditions are no places for unfit men. This fact enphasises the importance of rehabilitation in hospitals and special centres.

The Navy possibly contains a larger proportion of volunteers than the other Services. This may not be
nteer is more readily
tion of blaming fate.
the Navy's ubiquity
it comprises sailors,
is a Naval tradition
doctor first and fore-
most—and of what could a man more rightly be proud? "Hospital blues" have long seemed to me to be psychologically bad; when up and about patients of a Naval hospital wear ordinary uniform "ashore" and a simple dark blue rig when on board.

Too much has been said of the "hospital atmosphere." This may be good or bad: it varies between hospital and hospital, and between ward and ward in the same hospital. *It depends on many things, but above all on* the quality of the staff, especially the medical and nursing staff. The usual assumption is that the hospital atmosphere must be thoroughly bad, and it is thought necessary to send patients to rehabilitation centres not so much to recover from the final effects of their illness as to recover from the effects of its hospital treatment. Indeed, the tendency has been to transfer them as soon as possible from the miasma of the hospital to the ozone of the rehabilitation centre. From the viewpoint of the local lesion such early transfer may be premature. This is not a criticism of rehabilitation centres, but of their misuse. The right time for "rehabilitation" to start in most orthopædic cases, and in many others, is on first admission to hospital; and the principal aim should be the *prevention* of the ill effects of the so-called "hospital atmosphere." Rehabilitation in hospitals and rehabilitation in special centres should be complementary rather than mutually exclusive.

ORGANISATION OF REHABILITATION

The following is a summary of the organisation of rehabilitation at the largest of the RN auxiliary (or temporary) hospitals—one very beautifully situated, ten *miles from a university city, with its medical school* and other amenities.

In their more restricted sense, the rehabilitation treatments here are divided for convenience into: (1) recreational treatment, (2) physiotherapy, and (3) occupational therapy.

Recreational treatment is modified physical and recrea-

was a physical training instructor in civil life, the other a schoolmaster. Most orthopædic patients not acutely ill on admission start recreational treatment forthwith. Those confined to bed carry it out there. Patients who
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which form a large part of modern physical training, and a large part of its remedial application, the following are played: bowls, croquet, skittles, darts, billiards, table-tennis, deck-tennis, lawn tennis, badminton, clock and miniature golf (up and down steep slopes), volley ball, fencing, cricket, football, &c. These can all be used remedially as well as diversionally. The importance of variety also needs no emphasis.

The gymnasium in the rehabilitation block was unavoidably small, and the hall of the aforetime mental hospital has been used for the larger classes and indoor games. Use of the ideal place—the open air—is much curtailed here by the local climate, in spite of the provision of tarpaulins by the British Red Cross Society.

What strikes visitors most—even more than the agility of patients in plaster—is the universal infectious enthusiasm and spirit of enjoyment, which probably depend more than anything on the personality of the instructors.

Physiotherapy.—Though the PRT instructors, as experts in physical education, are the most appropriate exponents of recreational treatment under medical supervision, they are not usually the most suitable persons to carry out individual treatment of patients' local lesions in the early stages. This falls to chartered physiotherapists. Of these we have four: a Naval petty officer (hostilities only) and three members of the Physiotherapy Service. Their accommodation includes six cubicles—containing plinths and apparatus for heat, light, faradic and galvanic treatment—and, above all, a small gymnasium fitted with the usual accessories such as mats, stools, wall bars, and various means of *applying progressive exercises, from assisted and* gravity-free exercises up to those against graduated mechanical resistance. Much the most important part of the physiotherapists' duties is instruction in and supervision of progressive exercises—a function which seems to be denied them in some rehabilitation centres, where they have become mere rubbers and electricians. The opposite popular tendency—the almost total *neglect of such accessory methods as heat and electrical* stimulation—is also avoided.

Passive movements (except as manipulations under anæsthesia) are generally banned in favour of movements which can be carried out voluntarily, but they are used, in suitable cases, for those physiological movements of joints which are without direct muscle control, and also extensively in paralytic cases before the stage at which re-education becomes possible. The fashionable condemnation of passive movements has been much too sweeping, with disastrous consequences for some patients with lower motor neurone paralysis.

Occupational therapy.—General work in the wards, galleys, and grounds is carried out by patients under the direction of the sick-berth staff. The rehabilitation block contains an occupational therapy workshop, with store and office, and there is provision under a trained occupational therapist and a staff of VAD's for carpentry, fretwork, turning, French polishing, boot-repairing, fancy leather work, spinning, weaving, netting, rug-making, knotting, basket-making, raffia-work, model-making, toy-making, soldering, poker-work, and tailoring. Minor surgical alterations to boots are undertaken, and the construction of clogs for walking plasters. Occupa-
tional
ients for whom it is
directl
also diversionally,
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most ratings are
without intellectual pursuits and gladly turn to manual ones. Steps are being taken to remedy the undue tendency towards indoor occupations, and those savouring strongly of the "arts and crafts" movement. The triumph of the æsthetes over the philistines, which is common to most occupational therapy departments nowadays, is probably neither wholly desirable nor wholly avoidable.

Prescription, coordination, and supervision.—Rehabilitation treatments, like any other treatments, are prescribed in the patient's notes, which are sent to an office in the rehabilitation block at a fixed hour. Here a VAD clerk arranges the various appointments, and at *the same time the concerned PRT* instructor, physio-
l therapist can all take such
Al
recent trend in rehabilitation schemes to plan the whole of a man's day for him. In hospital this may amount to
over-regimentation, and
to individual effort an
orthopædic specialist an
assist him is so arrang
supervision of the treatments.

Records.—During the recovery of joint injuries—accidental or operative—the girth of the joint, the girth of the muscles, the angle of movement, and the muscle power are measured weekly by one physiothera-
easurements
The charts
progress of
muscle power, a factor which is too often neglected in assessing a patient's fitness for duty.

Selected groups of cases are specially recorded for investigation, but the conditions of Naval service make serious follow-up wellnigh impossible. A frequent complaint is that medical officers of ships or shore
of patients whom they send
therefore, on the discharge
to the originating medical

officer a summary of the diagnosis, treatment, result, and disposal. This is in addition to the routine letter sent to his next medical officer when the patient returns to duty. This system, which has been widely appreciated, has been made possible by the provision of a VAD stenographer, who also types the notes on new cases and the letters concerning patients sent for consultation.

Clinical photography is carried out by the radiological department under Surgeon Commander J. M. Fitzpatrick, RN.

Temporary splinting.—Temporary plaster-of-paris splinting, sometimes incorporating elastic traction appliances, is extensively used in the rehabilitation treatment of some patients. The practical part of this work is carried out by two VADs attached to the theatres, who have been trained as plaster technicians.

Coöperation with schoolmaster.—The wish of the Educational Branch to coöperate in rehabilitation was welcomed. Importance is attached to the stimulation of an intelligent interest in current affairs, and many establishments have "information rooms" in which instructional material—literature, diagrams, maps, photographs, &c.—is displayed regularly and with frequent changes. With the generous help of the British Red Cross Society an information-room has been furnished in the lobby of the hall of this hospital, so that patients have an opportunity of absorbing mental fare provided by the schoolmaster in the intervals of their recreational training supervised by the PRT instructors. It falls to the schoolmaster also to arrange debates, discussions, and other means of adult education, with the more particular object of stimulating and maintaining a lively topical interest. Valuable as the schoolmaster's services may be, it must be acknowledged that most patients turn much more readily to handwork than to headwork.

Social services and entertainments.—Anyone coming from a civil hospital misses the expert help of an almoner, and tends to mistrust—and rightly—his own amateur dabbling. The dietitian is another highly valued aid who has not yet found access to Service establishments. A canteen is provided, its profits going towards patients' amenities. A library is run through the good offices of the Red Cross Society.

The *least* amount of "passive" entertainment required for the maintenance of morale in Service hospitals is difficult to estimate, and must be inversely proportional to the amount of active work and recreation provided. The *desirable* amount is even more difficult to determine. At this hospital the tradition has been one of liberality—two film shows and a variety entertainment weekly, plus occasional organised and unorganised afternoons "ashore," if not interfering with treatment.

Sick leave has been condemned too freely. Leave is at least as advisable and even necessary for the sick man, or erstwhile sick man, as for the well one. A substantial period in hospital should usually be followed by some leave before return to duty, and often a really long period in hospital should be interrupted once (rarely more often) by a visit home. These are leaves with a therapeutic object. I regard leave, rightly handled, as an aid to rehabilitation. The same cannot be said of "plaster leave," which often is therapeutically unnecessary; rehabilitation centres are usually better places than their homes for patients in plaster-of-paris. The Navy, in permitting sick leave at the medical officer's discretion, puts within his grasp an additional weapon for rehabilitation, but it must be handled with the respect due to weapons.

For permission to publish this account I have to thank Surgeon Vice-Admiral Sir Sheldon Dudley, Medical Director-General of the Navy. I should also like to acknowledge the help of Surgeon Rear-Admiral H. R. B. Hull, superintendent of the hospital, Surgeon Rear-Admiral R. Milne, orthopædic consultant to the Navy, Surgeon Captains W. I. Gerrard and A. W. Kendall, the senior medical officers, Surgeon Commander J. Coulter, the sports and instructional officer, Surgeon Commander (D) H. P. Buchanan, the entertainments officer, the medical officers who have been my assistants from time to time, and Mrs. Quentin Irvine and others of the British Red Cross

Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the section of neurology on March 1, with Air Vice-Marshal C. P. SYMONDS, the president, in the chair, a discussion on the

Treatment of Acute Meningitis

was opened by Dr. M. MITMAN. He recalled that in 1907–08 the case-fatality rate of young adults suffering from meningococcal meningitis was 74%. During the last war serotherapy and spinal drainage reduced the figure to 39%; in this war the figure is 3·5%, thanks chiefly to chemotherapy. He warned against assessing the value of any specific therapeutic measure without considering the four chief factors influencing mortality. The first, the virulence of the organism, differs in every epidemic and in the intervals between them. The second, immunity, is related to the capacity to overcome infection at different ages. Startling results of therapy, such as 99–100% recoveries, occur only in the most favourable age-groups; the figures are much higher for the extremes of life. (Commenting on this later, Surgeon Commander ELEY, US Navy, said that tender age is not entirely responsible for the high fatality-rate among infants: diagnosis on them is delayed because their open fontanelles allow considerable increases in intracranial pressure.) The third factor influencing the fatality in an epidemic is the organisation for the prompt diagnosis and efficient treatment of cases. In a severe outbreak in the USA, for instance, the reduction of case-fatality from 12·8% at the beginning to 1·5% a few months later was attributed largely to expeditious treatment. The vital importance of the diagnosis of meningococcal infections in the septicæmic phase lies in the amazing success of chemotherapy at this stage. The fourth factor influencing a favourable result is the specific therapy used. The place of penicillin for meningococcal infections is as yet uncertain: it may be merely adjuvant. The sulphonamides, in Dr. Mitman's view, are still the drug of choice, and his preference is for sulphadiazine, although he agreed with other speakers that a drug with less tendency to urinary complications, such as sulphamezathine, might prove more suitable after further trial. He prefers a moderate dosage. Big doses, especially intravenous loading ones, are given with excessive quantities of fluid which wash out the drug; the net result is the same as when a moderate dose is given with less fluid, but the danger of side-effects is greater with the big dose. Ninety-five per cent. of cases respond to sulphonamides. The remainder, representing fulminating cases and those with adrenal syndromes, require adjuvant therapy. On the theory that there is some adrenal failure in such cases, substitution therapy is used—adrenal cortical extract or desoxycorticosterone acetate for the adrenal deficiency; sodium chloride or lactate with fluids to compensate for the depletion of sodium and of water: glucose for the disturbance of sugar metabolism; and plasma for symptoms of shock.

Dr. HONOR SMITH found neither penicillin alone nor sulphonamides alone adequate for the treatment of pneumococcal or streptococcal meningitis, although penicillin is seldom necessary in meningococcal infections. Only by the intrathecal route can adequate doses of penicillin reach the meninges. It must have free access to the cerebrospinal pathways, and the presence of block is an indication for cisternal or ventricular administration. In cases of pneumococcal meningitis treated at Oxford the primary infection present was usually an otitis media or a sinusitis, less commonly a fracture of the skull involving the sinuses, and only rarely a simple pharyngitis. On the first day of treatment 8000–20,000 units of penicillin is given intrathecally, combined with systemic penicillin to control the primary infection, and with sulphadiazine in 2 g. doses four-hourly, the loading dose being 4 g. Next day the spinal fluid should be sterile, although the cell-count may rise as the result of chemical reaction. A second dose of penicillin is given at the time the spinal fluid is removed for examination; rarely a third is necessary 12 hours later. A primary focus left untreated often clears up during this treatment. Relapses, if repeated, suggest some intracranial focus to which the penicillin is not obtaining proper access.

Brigadier **Hugh Cairns** said that 50% of cases with intracranial foci inaccessible to [illegible] help. The diagnostic problem [illegible] the focus is extradural or int [illegible] intradural. He and other speakers called particular attention to the importance of a scrupulous aseptic technique in the performance of lumbar puncture.

[illegible] the [illegible] me[illegible] which occasionally occurs. Penicillin as at present available is only a third pure, and not all specimens are suitable for intrathecal use. Batches which cause severe reaction on intramuscular injection should be rejected, and specimens known not to irritate should be reserved [illegible] ers cannot guarantee the preparation of a s best performed in 's. *pyocyanea* is most difficult to treat because it is not susceptible to either

during the dividing stage of the organism. Within 24 hours almost all organisms divide, but the small fraction of 1% which do not divide remain alive and are responsible for some of the relapses. Commenting on Dr. Mitman's statement that serum and sulphonamides have been reported to produce worse results than sulphonamides alone, Dr. Duthie suggested that serum may inhibit cell division, thus limiting the number of organisms in the susceptible stage; he was prepared to investigate the laboratory aspect of this possibility.

Dr. **William Gunn** thought there might still be a [illegible] py provided reatment of to the high)r. **Donald Paterson** had secured a small amount of Alexander's serum which he proposed to try out.

Commenting on the importance of prompt treatment in the smal[illegible] e.g., those abruptness consultant, w illness, might

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

When the society met on Jan. 19, for the first time since the outbreak of war, Prof. **Farquhar Murray** of Newcastle, the retiring president, introduced the new president, Dr. A. A. **Gemmell** of Liverpool. A symposium on

Virilism

was opened by Dr. C. P. **Brentnall**, who described a case of *Arrhenoblastoma of the ovary associated with pregnancy and labour*. There were no undue symptoms until the woman reached the fourth month of pregnancy, when evidence of virilism began to appear; masculine distribution of hair appeared on the abdomen, chest, and face; the voice became deeper and the clitoris enlarged. There were none of the usual defeminising phenomena: the breasts, instead of atrophying, showed the usual changes associated with pregnancy, and the amenorrhœa of pregnancy could not be described as defeminising. Glycosuria was constantly present, and this was probably another example of the Achard-Tiers syndrome. The woman was delivered by cæsarean section, and the ovarian tumour removed under local anæsthesia. Lactation then began and continued normally. The phenomena of virilism disappeared in six months after operation, except for the deeper voice. At birth her child appeared to be normal except for the external genital organs. There was no doubt that she was a female pseudohermaphrodite. The clitoris was much enlarged, and the labia majora were enlarged and corrugated. There were no labia minora, and no external entrance to the vagina. The urethral orifice was situated at the base of the clitoris, and the perineum extended unbroken to the anus. On the fourth day of life there was a discharge of blood and mucus from the urethra, such as is not uncommon from the vagina of newborn girls; and this was taken as a proof of the presence of a normal uterus. Nature's and laboratory experiments on the administration of androgens to pregnant mammals were discussed.

sation of the external genitalia.

Dr. J. W. A. **Hunter** described a case of *Arrhenoblastoma of the ovary* in a single girl aged 19 years. Her periods began at 11 years and were regular until she was about 15. After that time her voice became deep and her abdomen enlarged. Nine months later menstruation ceased and the breasts were reduced in size. Eighteen months after this hair appeared on the face, legs, and chest. She came to hospital because of the striking increase in size of the abdomen. A hard tumour could be felt, reaching nearly to the xiphisternum. There was free fluid in the abdomen; and at the time she was admitted to hospital she had a pleural effusion. A large tumour with an enormous blood-supply was found at laparotomy and removed with great difficulty. No metastases were seen. The patient's condition while in hospital was never good; and in spite of blood-transfusion she died about 12 hours after the operation.

Dr. J. W. **Bride** described another case of *Arrhenoblastoma of an immature type*, in a single woman of 32 years, who complained of menorrhagia for five or six months. Examination showed hirsutism, especially of the face, necessitating daily shaving. Her intellect was dull. There was a masculine distribution of hair on the abdomen and a hard mobile mass was palpable there. The clitoris was greatly hypertrophied. Laparotomy showed a solid ovarian tumour about the size of a fœtal head, and this was removed. Two years later the clitoris [illegible] on the face was much less, and : only once or twice a week. od.

Dr. A. A. [illegible] male [illegible] reast development; but had [illegible] oice was of female timbre and she had a normal feminine outlook. On examination under anæsthesia on April 26, 1944, the phallus was found to be 2 in. long, but no other abnormality was apparent. On May 5 Dr. Hain of Edinburgh estimated the ketosteroids as 35 mg. per 24 hours, and pregnandiol as 60 mg. per 24 hours. In June these had increased to 74 mg. of ketosteroids and 73 mg. of pregnandiol. On June 6 Mr. C. A. Wells amputated the phallus, and laparotomy was performed. The uterus was small and the ovaries appeared normal. A biopsy of the right ovary was taken. This showed atretic and normal immature follicles, and two large follicles, one with both granulosa and theca layers. Both adrenals were enlarged. A diagnosis of conger[illegible] hypertrophy was made, and removed the left suprarenal by was elliptical, measuring 3·5 i weighed 23 g. after fixation. Vine's stain showed an androgenic reaction. There were no fuchsinophil cells in the outer zone. In the mid-zone 25% of the cells gave a positive stain, and less than 25% in the inner zone. The ketosteroid and pregnandiol levels fell to 32 and 31·5 mg., but they had risen again by Jan. 3, 1945. Up to December, 1944, menstruation had still not occurred; and there had been no enlargement of the uterus and no change in voice.

Mr. T. N. A. **Jeffcoate** described a case of *Adrenogenital syndrome due to an adenoma of the adrenal cortex*, in a single woman of 30 years, who complained of primary [illegible] hair on the cheeks, chin, and [illegible] d been present for 16 years, [illegible] soon after the age of 11. She had a deep voice and a muscular and masculine figure with male distribution of hair. The breasts were des deeply pigmented. There of the clitoris and a septate cervix. Psychologically she was mainly feminine, interested in clothes and babies; sexually she was neutral. At laparotomy a tiny infantile uterus was found. The ovaries were pale, with numerous tiny cysts due to atretic follicles. Biopsy was performed to confirm that the glands were ovarian. The left suprarenal was felt to be larger than the right and appeared spherical. The patient recovered from the operation and later a ketosteroid secretion test was performed. The result of 140 mg. per 24 hours was the final link in the chain of evidence. Mr. Wells agreed to explore the left adrenal through the left loin three weeks after laparotomy. In the upper pole of the gland he found a rounded tumour which shelled out easily; this was removed together with a small portion of normal tissue. About half the adrenal was left behind. The tumour, roughly ovoid in shape, was 2 inches in diameter, greenish purple in colour, dull red on section owing to considerable extravasation of blood. Microscopically it was seen to be composed of cells of recognisably adrenal origin. They showed a strong positive reaction to Vine's stain. Although at the time the pathologist suggested that the tumour was of a low grade of malignancy, the patient is alive and well 2½ years later. The results of the removal were classical. Eight weeks after operation the patient menstruated for the first time; and has done so regularly since. The uterus has grown to about normal adult size. After 2½ years the voice and the clitoris are unchanged, the breasts have enlarged, and the skin is of finer texture. The figure is slightly more feminine. The hair did not drop out dramatically, as is often described, but is slowly becoming more feminine in distribution, and after electrolysis is showing a diminished tendency to return. The ketosteroid excretion within a month of operation had dropped to 3 mg. in 24 hours. Psychologically she is slightly more feminine, more modest, and less self-conscious.

Reviews of Books

Rehabilitation of the Injured

Occupational Therapy. JOHN H. C. COLSON, CSP, MAOT, technical director of rehabilitation, accident service, Royal Sheffield Infirmary and Hospital. (Cassell. Pp. 226. 15*s.*)

THIS book should be useful to the surgeon who has had little experience of occupational therapy and wants to prescribe it for his injured patients. The crafts are analysed carefully, and graded voluntary movements are suggested for every muscle and joint. Mr. Colson is perhaps more keenly interested in the patient's muscles and joints than in his mind. Yet the response to remedial work must always depend largely on the patient's attitude to it. The occupational therapist knows that if she can make him curious about what the patient in the next bed is doing, his impulse to imitate, and his innate desire to construct will do the rest: he will consent to having his ankles harnessed to Mr. Colson's loom, or do anything else she suggests. She knows, too, that unless his interest is kept up progress will be disappointing. Mr. Colson's contention, that "physical and psychological occupational therapy are so fundamentally different in their scope and work that a separate book is needed for each subject," is thus hardly borne out in practice. Only if the patient continues to use his mind will he benefit his body and limbs. This shows itself in the details of weaving: Mr. Colson considers that not more than two heddles should be used, a good arrangement while the patient is learning to flex and extend an injured knee-joint; but pattern weaving on a loom with six pedals is almost as good a coordinating exercise as playing the pedal keyboard of an organ. A patient has become keen on the patterns he learns to weave on a handloom, and when promoted to a foot-loom will unconsciously coordinate delicate pedal movements in order to complete his design. In washing-up may be "the fingers are flexed into a tight fist round the cloth in order to reach the inside of the article, the drying actions consisting in full range pronation and supination of the forearm"; but unless the patient is willing to wash up, he might just as well be "doing exercises" by command. Orderlies supervising housework must therefore understand something of everyday psychology—as Mr. Colson unconsciously recognises when he says they "must be good disciplinarians and keen." All the chapters on special occupational therapy are full of good matter, and curative workshops will find good use for this book.

Stitt's Diagnosis, Prevention and Treatment of Tropical Diseases

(7th ed.) RICHARD P. STRONG. (H. K. Lewis. 2 vols. Pp. 1747. £5 5*s.* the set.)

IT is opportune that one of the best textbooks on tropical medicine should now reappear, again under the editorship of Prof. R. P. Strong. The two volumes resemble the previous edition in format and matter; minor alterations and additions have remedied omissions and brought the book up to date. Development of the sulphonamides in the treatment of bacillary dysentery, the vaccine prophylaxis of epidemic typhus, and the chemical, insecticidal, and insect-repellent agents employed in malaria prevention have all been included. Mite-borne typhus diseases are given more space, and a new clinical entity—Bullis fever, a tick-borne rickettsial disease encountered in American troops in Camp Bullis, Texas—is briefly described.

Nutrition and Relief Work

A Handbook for the Guidance of Relief Workers. (Published, for the Council of British Societies for Relief Abroad, by the Oxford University Press. Pp. 111. 5*s.*)

THE first three chapters of this little book give the basic facts about nutrition and undernutrition with—as the authors themselves say—"the familiar defects of brevity." Simplification has certainly led to some doubtful statements, but they make some good points too, for example: "Most national diets, if not nutritionally adequate, can usually be made so by suitable modification, without any drastic alterations in their general pattern. This is an important principle to bear in mind, because efforts to improve nutritional standards by methods which run counter to long-established traditions and usages will be very difficult to apply in practice." The eating habits of European countries, and the repercussions which the war may have had on them, are discussed at some length. In Hungary, for instance, we learn that so much more sugar was eaten in the towns than in the country, before the war, that an overall ration which meant a cut of 50% in urban consumption allocated to country folk several times as much as they had ever taken up before, and actually led to an increase in the national consumption. This section seems to hint that the essence of a hot meal in many parts of Europe is soup. The inevitable tables of food values follow, with some practical hints about food storage, and a description and diagrams of 14 different kinds of field kitchens and ovens. There are appendices on European currency, weights, and measures, suggested forms for reports, and a German-French-English glossary of words likely to be required by a relief worker. The book, turned out of the same mould as *Famine* and *Relief*, may help those setting out to put Europe on its feet again, and can be recommended to anyone interested in the food and food-habits of countries other than his own.

Bibliography of Aviation Medicine Supplement

P. M. HOFF, E. C. HOFF, J. F. FULTON. (C. C. Thomas. Pp. 109. $2.50.)

THIS supplement appears two years after the publication of the original bibliography, and the classification, arrangement, and style closely follow that of the parent volume. A new sub-heading on survival and rescue covers work on self-preservation at sea, and in the arctic or the jungle. The two most notable additions are the English translations of Paul Bert's *La Pression Barométrique* and the Russian textbook *Fundamentals of Aviation Medicine.* It is to be regretted that the necessity for military secrecy prevents the authors from including many references which would be of outstanding interest, but in spite of this the bibliography and its supplement provide a well-arranged and reasonably comprehensive system of references to the fundamental work on which aviation medicine is based.

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THE LANCET

LONDON: SATURDAY, MARCH 24, 1945

Partial Starvation and its Treatment

IN August 1940, when our fortunes were at their lowest, the PRIME MINISTER foretold the eventual liberation of Europe, and added:

> We shall do our best to encourage the building up of reserves of food all over the world, so that there will always be held up before the eyes of the peoples of Europe, including—I say it deliberately—the German and Austrian peoples, the certainty that the shattering of the Nazi power will bring them all immediate food, freedom, and peace.[1]

To bring immediate food, freedom, and peace must still be our aim, but so far we have only been moderately successful. Sir JAMES GRIGG, Secretary for War, told the Commons on March 13 that about a million tons of food had been sent to Italy up to the end of last year; by February Greece had received 150,000–200,000 tons; and over 300,000 tons have been provided for France, Belgium, and Holland since D-day, including substantial contributions from the stocks of the Ministry of Food. He then went on to say:

> But though we have got so far without disaster, I do not conceal from the House my fear that in the coming months the demands for foodstuffs for the liberated countries may become almost overpowering. The news from Holland still in German hands shows that the population are in desperate straits, and . . . when liberation comes there is likely to be little help from local resources. Then, when we get into Germany, there will be displaced persons, not by their thousands but by their millions, who will look to the armies for food. The combined resources of the Allies may be strained to the utmost to prevent hunger and indeed starvation, especially if our victory comes before the new harvest is gathered.

In parts of Europe—to say nothing of the East—scarcity of food is not a mere possibility but already a fact. During this year therefore a great many doctors will have to be prepared for dealing with the effects of under-nourishment. We must hope that downright starvation—lack of everything but water—will be rare: most of the cases will be suffering only from a deficit of calories, of protein and fats, of mineral elements, and of vitamins. Nevertheless intelligent care will be very necessary. The manifold results of faulty balance in the diet will add to the difficulty, and symptoms are likely to be protean.

Straight starvation has been investigated in animals and man, as MAGEE[2] reminded the Nutrition Society last year. Many have assumed that once hunger pains have disappeared, as they do about the fifth day, death from starvation is a gentle fading away, not entirely unpleasant: but unfortunately this may not be so. MAGEE pointed out that the body conserves the strength and weight of the nervous system, the skeleton, endocrines, and reproductive organs, and the losses fall on the skin, the muscles, and the digestive organs. The most noteworthy effects are on the alimentary system: the hydrochloric acid of the stomach decreases, the columnar cells are flattened, absorption is lessened, and intestinal ulcers develop, especially in the large intestine. These findings have been observed in man as well as animals and probably account for the diarrhœa simulating dysentery described in cases of severe malnutrition. It is perhaps worth noting that immunity reactions are lost by the starving, and it may be necessary to vaccinate them afresh if smallpox is about.

The nutritional œdema already mentioned in reports from the Continent is caused by having insufficient protein in a diet low in calories.[3] The limited amounts of protein which would suffice if the calories were adequate are diverted to produce energy: the plasma thus becomes deficient in proteins, its osmotic pressure falls, and fluid leaks into the tissues; and much salt in the diet is likely to increase this leakage.[4] Children do not develop typical œdema, but are pale and doughy-looking. They become thin—that is, less waterlogged—on being fed. When this œdema is combined with gastro-intestinal trouble the patient is in grave danger. Minor features, recalling nicotinic-acid deficiency and scurvy, are a red desquamated tongue and swollen inflamed gums. Major symptoms are dilatation of the stomach and a profuse watery diarrhœa, with frequent evacuations, often mistaken for dysentery. There are severe pains in the stomach and lower gut, and the diarrhœa leads to dehydration. Judging by recent reports nutritional œdema was seen among the French and Belgians more commonly during the first two years of occupation than it is now. After the early days these people supplemented their diet from an extensive black market, and so avoided the worst effects of the official ration. Neurological symptoms suggestive of vitamin deficiencies have not been generally described, though SIMONART[5] claims to have found neuritic signs which were relieved by injections of aneurin. Clinically his cases had more in common with nutritional œdema than with beriberi, and it would be unfortunate if his solitary experience was used as an argument for sending vitamin concentrates in place of foods.

The treatment of partial starvation was reviewed by GOODMAN[6] in an address to the Medical Women's Federation a year ago. Mild cases will promptly respond to a diet of easily digested foods—particularly milk, eggs, meat, fresh ripe fruit, and cereals. (In view of transport difficulties, dried milk, even dried skimmed milk, dehydrated fish, and dried eggs will probably be used, and they should prove beneficial.) Much fat is contra-indicated, because of the diarrhœa. After a fortnight the patient should be able to take any ordinary diet, but absolute rest in bed for at least two weeks is highly desirable. Intermediate cases require hospital treatment and good nursing. Feeding should be cautious, beginning with milk and dairy products, and avoiding excess of fat. Pepsin and hydrochloric acid may be needed to help digestion, and mild diuretics to get rid of the œdema. Mercurial diuretics have been found dangerous: EVANS and PERRY[7] thought that occasional deaths following the use of such drugs for cardiac or renal œdema might be connected with lowering of plasma protein; and this factor would of course operate also in the starving. Serious cases must have hospital care, good nursing, warmth, and good food if they are to have any chance at all. They need frequent feeds of milk, gruels, and lean meat, with pepsin and hydrochloric acid. MAGEE referred to the value of intravenous injections of glucose, and of opium to control diarrhœa. The prognosis is good in mild cases except when the patient is very old; in intermediate cases it is good for those between 20 and 40 years of age, but bad for the very young and very old; in serious cases it is bad for all ages, but those between 20 and 40 have the best chance. As so often, women have a better chance of recovery than men.

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[1] Quoted by Famine Relief Committee (67, Brook Street, London, W1) in a memorandum to the European Committee of UNRRA.

[2] Magee, H. E. *Bull. Nutrition Soc.* (in press); and see *Lancet*, 1944, i, 436.

[3] Jimenez-Diaz, C. *Nutr. Abstr. Rev.* 1943, 12, 3878.

[4] Perakis, Bakalos, *Deut. med. Wschr.* 1943, 69, 746.

[5] Simonart, E. F. *Scalpel*, May 10, 1941; Jan. and May 20, 1942.

[6] Goodman, N. M. see *Lancet*, 1944, i, 576.

[7] Evans, H., Perry, K. *Lancet*, 1943, i, 570.

Of late years a new method of saving these severely ill patients has come into our hands: they can be nourished directly with protein digested into its component amino-acids, given intravenously with glucose. Severe inanition, nutritional œdema, and dehydration have responded to this measure, which was used during the famine in Bengal, and it has also given successful results with infants suffering from intractable diarrhœa, and with premature babies. Possibly the metabolic functions of the liver are helped by such hydrolysates. In Bengal the mortality among cases uncomplicated by pneumonia or malaria, treated in this way, is said to have been only 8%, whereas control cases treated with glucose-saline showed a mortality of 67%. Cases of dysentery with intestinal ulceration are stated to have benefited considerably. Unfortunately, however, amino-acid preparations suitable for intravenous injection are still scarce. A single preparation ('Amigen') in America is said to be safe; other English and American preparations may produce febrile reactions. Nor can amigen be readily prepared in large amounts. Serum and plasma, though not as good nutritionally as protein hydrolysates, have some food value, and also reduce œdema by restoring plasma protein; and though they carry a risk of infective hepatitis, they may well be used to save life. The important point is that the starving patient who cannot eat is no longer necessarily a lost man: we have found a new way of saving him, and must develop it.

One last point is probably relevant. It may be that the malnutritional state known as kwashiorkor,[8] described in the tropics and occasionally in Europe and America, has become common in occupied countries or in the East during the war. The patients—who show œdema, dermatoses, and a so-called deficiency bowel-pattern as demonstrated by X rays—are found to respond to the addition to the diet of the whole vitamin-B complex, either as liver or yeast; and parenteral administration of the vitamins of this group has been suggested. Let no-one imagine, however, that what liberated countries chiefly require are accessory food factors and special preparations of amino-acids. To quote our special correspondent's report on discussions with medical authorities in Paris: "Vitamins, I was told very emphatically, are not the problem: what is needed is meat and fats."

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[8] Williams, C. *Arch. Dis. Childh.* 1933, 12, 193; *Lancet*, 1935, ii, 1151; Brown, J. S., Trowell, H. C. *Ibid*, 1944, ii, 812.

Sir THOMAS LEWIS, FRS, physician to University College Hospital and consulting physician to the Ministry of Pensions, died at his home at Rickmansworth on March 17. He was in his 64th year.

Future of the Medical Museum

MANY years ago an eminent physician was discussing medical education with a museum enthusiast. "Museums!" he said. "Do you know what I would do with medical museums? Burn the lot." A survey of the hospital museums of the period, and indeed of many of the famous Continental collections, would have supported his verdict. A visitor to most of these museums must have been depressed by what he saw—an apparently endless series of jars containing specimens of doubtful value from which every vestige of colour had long departed, a few tattered and out-of-date catalogues, derelict zoological curios, a few prize dissections, a mouldy collection of botanical specimens, some obsolete surgical instruments, one or two dangling skeletons, and some wax models of skin diseases. No provision was made for the comfort or convenience of students: apparently they were not expected to sit down. It is not strange that little use was made of such museums except as a storehouse for specimens to be used by the teaching staff to embellish their lectures, or as a test of mental agility in the examination halls. Frequently specimens of little value were kept indefinitely because they had been presented to the museum by some influential member of the staff. (But there was a gleam of light in the darkness, for here and there were choice collections, carefully preserved, fully catalogued, and set out in such a way that they were of real value to the thoughtful student.) If such museums are not entirely a memory of the past, there has been much progress during the last 25 years, not only in the quality of material displayed but also in the method of arrangement. Many are, however, sti cramped by lack of space, money, and staff. I spite of this, the medical museums have increased i popularity. Both students and teachers tend to u them more.

There are still some who question the value medical museums; but, as Professor GREY TURNE pointed out in his stimulating Hunterian oratio they offer facilities for study which would be hard t replace by any other means. Moreover, they a of inestimable value to the student whose brain better served by the eye than the ear. The functio of a medical museum are education, research, an conservation. The first of these is the chief functio of a hospital museum: it is an additional weapon i the teacher's armoury; a place where the lesso learnt in the wards, outpatient department, an post-mortem room can be synthesised; a centre fo revision; a system of visual training which encourage the student to employ his powers of observation and a storehouse from which the teacher may dra whatever he needs to illustrate his lectures. It i probable that in the future the hospital museum will be used more and more, not only by the regula students but also by graduates returning for ment refreshment.

Medical museums may conveniently be divide into national collections, teaching museums, an special museums (e.g., public health, medicolega industrial, war collections, specialties, historica anatomical). All of these could well be included i the national museum, though for certain reasons thi may not always be advisable. Our national collectio has suffered disaster. On the night of May 10, 1941, the famous Hunterian Museum was severely damaged by high-explosive bombs and by fire: the greater part of the museum and many of its collections were destroyed. In his oration GREY TURNER says: "The disaster has not only imposed a greater responsibility than ever before, but has provided an *opportunity.*" The responsibility falls on the whole medical profession, for in the past the museum has been the proud possession of all—the best of its kind in the world. Its speedy restoration is not only a tribute to the past but also an obligation to the future. The President of the Royal College of Surgeons has asked for financial support in carrying out this great work and it is an appeal no member of the profession can ignore. Reconstruction is the watchword at the present time, and here is a work of reconstruction in which every member and fellow of the college may play a part. The plans for the future have been drafted on progressive lines which take into account the three essential functions of such a museum: it will provide for education, research, and the preservation of what is valuable. Here many of the special collections will find an appropriate home, while others can with greater advantage be dealt with elsewhere. The war has produced its own medical and surgical problems, and from them much may be learnt that will be of value in time of peace. We referred last week to the National War Collection now being made which deals with war injuries—a collection which offers promising scope for future investigation and adds further testimony to the value of the museum as an aid to research.

The future of the hospital museums is in no way affected by the establishment of a great national museum. The hospitals possess unique facilities: they have a constant supply of the material needed for teaching purposes. In the post-mortem room, X-ray department, photographic studio, pathological laboratories, and other special departments is a vast store of material from which may be drawn the exhibits necessary for the teaching museums of the future. The day of the pathological museum, as we knew it of old, is past; and already the leading hospital museums are adopting a broader view. A specimen of a heart affected with subacute bacterial endocarditis is instructive, but its value for teaching purposes is enormously increased by placing alongside the other organs included in the morbid process—what GREY TURNER has called a "group exhibit." To complete the picture may well be added colour photomicrographs, temperature charts, electrocardiograms, X-ray pictures, paintings, photographs, and any other clinical records bearing on the specimen under consideration. *By such a method* the whole teaching of ward, post-mortem room, and laboratory is revived; and the illustrations need not occupy much space. For nearly a quarter of a century the Wellcome Museum of Medical Science has been developing on these lines, and its value has been recognised both by teachers and students. Such a system carried out in the hospital museums, on however modest a scale, would have many advantages, for the hospital museum is always at hand and medical students have little time to spare. A complete picture could be presented of the more important diseases, but such exhibits would not replace the excellent regional collections found in most hospital museums at the present time. The process is capable of almost infinite expansion, and (where space and funds permit) ætiology, prevention, and treatment might be included, with a survey of recent experimental work. In considering the diseases of tropical countries a review of the disease in all its aspects is especially desirable. Moreover, such diseases lend themselves to the pictorial method, and students are thereby enabled to study visually the problems of environment and transmission with their bearing on prevention. Colour photomicrography can present a very perfect picture of the parasites in all stages of their development, and by such a method the finest specimens can be shown to students. Museums of this kind will naturally be closely associated with the schools of tropical medicine, in the same way that museums dealing with hygiene should be closely linked with the special schools which train for a diploma in public health. Museums dealing with the history of medicine also come into a special category. An ambitious scheme has been drawn up for the future development of the Wellcome Historical Medical Museum which should help to fill a regrettable gap in the medical education of this country.

The wastage of valuable specimens from the post-mortem rooms is often deplored: there is also a store of buried treasure in the photographic and X-ray departments of which little use is made. The selection, classification, and preservation of such material for teaching purposes may well be an additional function of the up-to-date museum, while a collection of lantern-slides and 16 mm. films recording clinical conditions and surgical technique might be added as opportunity offered. There is increasing demand for such visual aids to teaching, and extension in this direction would increase the value of the hospital museums of the future.

The future thus seems likely to bring an increase in the use of medical museums and a widening of their scope on the lines indicated. With the rapid progress in medical knowledge some rallying-point is needed where students, lecturers, and practitioners can survey the whole field of medicine and obtain information about recent developments. Museums of the three types mentioned are in a unique position to carry out this work. A museum should not be a depository but a workshop, and its value must be judged by the practical use made of the facilities which it provides for education and research. Moreover, as HIPPOCRATES wrote more than two thousand years ago "Much waste of time would be avoided if physicians began their researches by studying what the ancients have done before them."

REMUNERATION OF GENERAL PRACTITIONERS

THE committee set up by the Minister of Health and the Secretary of State for Scotland to advise on the range of total professional income of general practitioners in publicly organised services is inviting evidence from a number of organisations, but will also be prepared to receive evidence from interested bodies or persons other than those specially invited. Those wishing to place their views before the committee should *submit* memoranda to its joint secretaries at the Ministry of Health, Whitehall, London, SW1, before the end of April.

Annotations

MEDICAL SERVICE FOR CHILDREN

THE provisions of the Education Act, 1944, are to come into force on April 1, when local education authorities must implement section 48 (3), which makes it their duty to arrange for the provision of free medical treatment, *other than domiciliary, for all pupils attending* schools or county colleges maintained by them. The Ministry of Education circular of March 12, which outlines the scheme, follows the lines of the explanatory memorandum[1] issued by the Board of Education in January, 1944. Whatever is the fate of the National Health Service, there is to be a free and comprehensive service of medical treatment for all children between the ages of 2 and 18 years attending schools within the State system. It is true that visits of the general practitioner to the child's home will not be included, but the local education authority may, if it wishes, arrange for treatment at a doctor's surgery.

Every local education authority—under the Act the county and county-borough councils—must now work *out a scheme to cover the full range of hospital and* clinic treatment. The existing clinics for minor ailments, defective hearing, diseases of the ear, nose and throat, and eyes, orthopædic cases, dental treatment, child guidance, speech therapy, and rheumatism, which have been further developed in some areas than in others, must be revised and where necessary extended and strengthened. This will mean securing the services of more consultants—aurists, ophthalmic surgeons, dermatologists, and specialists in children's diseases. Another necessary reform, not mentioned in the circular, is the desirability of all whole-time medical personnel in the school medical service undertaking active duties in a children's department of a hospital for some part of their time, whether as a clinical assistant to the hospital pædiatrician or as a registrar with beds to supervise. Arrangements for hospital treatment are to be comprehensive provided it is confined to children referred to the hospital by the education authority, or children *for whose treatment the authority* has accepted responsibility. Authorities are likely to vary in the way they go to work under this definition, but two things seem desirable. First, having established its scheme, the authority should authorise private doctors to send any child who comes within its scope direct to a hospital or clinic for treatment, without any formal acceptance of each case, which would cause delay and irritation. Secondly, in framing its scheme the authority should specify hospitals at which treatment can be given at the authority's expense; clearly not every hospital is staffed and equipped to deal with all conditions, and the authority must ensure that children requiring special treatment do come under the care of a specialist. The circular suggests that in rural areas without clinic facilities arrangements should be made with local general practitioners to treat children referred by school medical officers or nurses, either in the schools or in the doctors' own surgeries; it is not clear how this will work out when the family doctors practising in an area are not in partnership. The same arrangement is suggested for dental treatment in areas where clinic facilities are lacking.

While the war lasts, and for some time afterwards, progress towards a comprehensive medical service for children will unavoidably be restricted by the shortage of civilian doctors, dentists, and nurses; and when a National Health Service is in full swing the children's service will be *absorbed into that.* But in issuing their circular the Ministry of Education are clearly encouraging local authorities to make the best provision they can for children in the interim period.

SHOCK TREATMENT AS AN EXPERIENCE

THE doctor cannot explain how physical methods of treatment can restore a patient to sanity; neither can the patient give a clear account of the change that has meant so much to him. At a meeting of the section of psychiatry of the Royal Society of Medicine on March 13, Dr. J. Frank described what he has been able to discern, either from patients' reports, or from his own observation, of the experience of those undergoing treatment by artificially induced fits or prefrontal leucotomy. Pharmacological shock, by insulin or leptazol, and electrical convulsion therapy (ECT) are being given on an increasing scale, not only for psychosis but for psychoneurosis; and prefrontal leucotomy is being tried in cases of hypochondriacal neurosis, severe obsessionalism, and aggressive psychopathy. The fact that the same artificially-induced fits may bring a change for the better in the manic-depressive, the schizophrenic, and the neurotic, means, he suggested, either that there is some common denominator in these conditions or that the change is due to the subject's experience of the convulsion.

In 650 cases treated by ECT at Graylingwell Hospital the best results were obtained among those depressives who showed a common denominator in physical signs such as motor retardation, loss of weight, anorexia, insomnia, and constipation. Conscious reactions among these patients were scanty. They were a little confused for an hour or two after the fit; and if the confusion lasted longer than that he suspected cerebral arteriosclerosis. They had little deep insight into their previous condition: "I don't know why I felt like I did, or thought such terrible things; but I'm all right now, and know my thoughts were wrong." Dr. W. Mayer-Gross, touching on this point in the subsequent discussion, remarked that the rational conscious insight of depressive patients is good. The treatment changes them, and after the change they are naturally unwilling to dwell on their former condition. Certainly deep analysis is out of the question soon after treatment, being liable to provoke a relapse. As Dr. Frank pointed out, the doctor must accept a paradox: before treatment the depressive patient cannot be analysed because he is incapable of transference, and after treatment he is capable of transference but cannot take the strain of analysis. His doctor's task is thus only to provide him, during recovery, with as apt an environment as possible, both in the wards and after discharge. A good group spirit in the ward, and association with other recovering patients, will do much for him.

Retrograde amnesia covers the short preconvulsive aura in ECT; nevertheless all patients dread the fits—depressives, however, less than psychoneurotics. Yet fear of the fit cannot of itself be held responsible for the improvement, as Dr. L. C. Cook made clear in the discussion. In 275 cases he had assessed overt apprehension, and found that out of 11 showing gross fear, only 1 improved; of 56 showing moderate fear 18 improved; of 61 showing little fear 21 improved; of 95 showing a normal reaction 47 improved; and of 52 showing undue indifference 24 improved.

Maniacal reactions after the fit are uncommon in depressives, Dr. Frank said, though many have a sense of euphoric well-being—which they do not usually connect with the treatment unless the idea is suggested to them. Little as they like the fits, they turn up regularly for them, as outpatients; whereas psychoneurotics tend to fall off. He found no evidence, in the dreams or fantasies of depressives, to indicate that this perseverance sprang from a desire for self-punishment: on the contrary, after 4 or 5 fits their sleep became restful instead of disturbed, whereas psychoneurotics often had nightmares of train crashes, flood and fire, which might be a compulsive recapitulation of the fit itself.

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[1] See *Lancet*, 1944, i, 153.

Recovered depressives are apt, he finds, to express their gratitude for convulsion therapy with a good deal of shallow and insincere politeness. He puts this down to a "fading of colour" of the personality comparable with that seen after leucotomy and severe organic deteriorations, but with the difference that after a couple of months the dimming effect of ECT passes off, and the personality recovers normal vividness. Depressed patients treated with leptazol are able to recall terrifying, preconvulsive auras of annihilation which seem to last endlessly, though in fact they occupy only 15–30 sec. These patients often mime repressed memories immediately after the fit, but this, he finds, does not help them: they are not suited for the conveyor-belt of fit treatment.

Insulin treatment produces a curious type of awakening in about 80% of patients: they talk in an infantile manner for a time, and seem to recapitulate the early phases of emotional development. He spoke of the "warmth and congruity of affect," produced by insulin coma in nuclear schizophrenics, as a remarkable achievement.

Experience of leucotomy is especially odd: even in patients of high intelligence with well-preserved personalities, the operation seems to have less subjective significance than an appendicectomy. A doctor and a medical student so treated had little notion of the theory of the operation, or even its site, though they had discussed it beforehand, and saw the scars daily. Dr. Mayer-Gross suggested the need for animal experiments in the further study of these methods of treatment; but no-one raised the question of human volunteers of normal mentality. It might be difficult to find candidates for leucotomy, but some normal opinions about the effects of induced fits have already been recorded.

BLOOD IN THE EYE

After a blow on the eye with a blunt object it is not uncommon to find blood in the anterior chamber. This blood comes from a ruptured iris vessel, and the hæmorrhage may be repeated in a few days. Blood-cells normally leave the anterior chamber by entering the iris crypts, and thence by way of the iris stroma reach the suprachoroidal lymph-space and vorticose veins. In a slight hæmorrhage all the blood may have left the eye by this means in a few days, but if the blood is sufficient to raise the tension of the eye this normal line of evacuation will be closed owing to pressure against the unyielding fibrous tunic of the eye, and blood-cells or their remains may be driven between the corneal lamellæ to form blood-staining of the cornea. This is a serious affair, for such staining only clears very slowly if at all, and an eye so affected will certainly not regain its sight in less than two years.

Philps[1] has shown that blood-cells, if not evacuated from the anterior chamber, may remain there intact for months or even years; and this is not surprising, for aqueous humour and blood plasma do not differ greatly in their composition. Where the iris crypts have been destroyed or become blocked by inflammation blood-cells leave the anterior chamber slowly if at all, and do not travel by the canal of Schlemm in any quantity. Unless the hæmorrhage is very small the blood clots, and then the process of removal cannot begin until the fibrinous elements entangling the cells have been dissolved by the aqueous humour.

Rychener[2] advocates paracentesis of the anterior chamber in every hyphæma which completely fills it. It is not necessary to evacuate the blood-clot; indeed it is unwise to make too strenuous efforts to do so; and the lessening of the ocular tension produced by the operation will have the desired effect of re-starting evacuation of blood-cells by the normal route. In 13 patients with traumatic hyphæma and raised intraocular pressure Rychener has now used this treatment with satisfactory results. Formerly atropine has been used in these eyes to ward off the accompanying iritis, but there is a good case for using a miotic such as eserine instead. The increase in tension caused by the blood is further augmented by atropine, and in addition the surface area of the iris—and therefore its power to absorb blood-cells—is diminished by this drug. It seems therefore wiser to use eserine until the blood is absorbed, and then atropine until the eye is white.

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[1] Philps, S. *Brit. J. Ophthal.* March, 1940, p. 122.

[2] Rychener, R. O. *J. Amer. med. Ass.* 1944, 126, 763

NORWAY'S DELINQUENT CHILDREN

Some of the trials of community life are universal, and among them the child corrupted by evil communications is specially disquieting. Remedies have varied in different times and places: the Greeks, with some prejudice, killed Socrates; savage tribes, without prejudice, kill the child; while modern civilised opinion is in favour of changing the teacher and giving the child a fresh start. An account, by Ragna Hagen,[1] of Norwegian ways of dealing with neglected and problem children has some pointers for us. The opening quotation is significant:

> "It is curious to note that it is precisely the turn of the century—that is to say, the time when the care of neglected children by Child Welfare Councils was first instituted—which seems to have brought a change for the better in criminality among young men."—Norwegian Criminal Statistics, 1923–24.

The law which set up these councils, passed in 1896 against much opposition, stopped the punishment of children by ordinary courts of law: instead, those who committed punishable offences were to come under the care of a welfare council composed of the local judge, a member of the clergy, and five men and women elected by the municipal council of the district. In the larger districts several doctors and clergymen may take it in turn to serve, according to the chairman's direction. There has been a growing movement, in recent years, to include in the councils young men and women with modern training in the treatment of children. The councils conduct their investigations in private, no press reports being allowed. They are intended to prevent crime and to alter conditions acting unfavourably on the child. Before the meeting the child's home conditions are studied by a member of the council and a permanent secretary; this corresponds to the study made by the probation officer for children's courts in England. Reports are obtained from the police, the school, and the poor-law relief authorities, and the council member visits the home and tries to get at the root of the trouble by talking to the parents and the child. Often the family needs direct help—better accommodation, or work for the father. In 1930, among 959 cases (affecting 1068 children) dealt with by the councils, home conditions were wholly or partly to blame in 565.

Legally the councils have jurisdiction over children up to the age of 14; but in practice it is customary to leave the treatment of all children up to 18 in their hands. They have several ways of catering for the needs of children brought before them. They can supervise them in their own homes, place them with a responsible family, or send them to a residential home. If the child has committed a punishable offence he can be sent to a school home—presumably corresponding to our approved schools—of which there are four for girls and seven for boys in Norway. Further, children aged 7–15 can be sent to institutions with the forbidding name of "coercive schools" for up to a year; after that they either go home, or, if they need further discipline, to a school home. The results seem to resemble those of English

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[1] *Howard J.* 1944–45, 6, 187.

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THE provisions of the Education Act, 1944, are to come into force on April 1, when local education authorities must implement section 48 (3). which makes it their duty to arrange for the provision of free medical treatment, other than domiciliary, for all pupils attending schools or county colleges maintained by them. The Ministry of Education circular of March 12. which outlines the scheme, follows the lines of the explanatory memorandum[1] issued by the Board of Education in January, 1944. Whatever is the fate of the National Health Service, there is to be a free and comprehensive service of medical treatment for all children between the ages of 2 and 18 years attending schools within the State system. It is true that visits of the general practitioner to the child's home will not be included. but the local education authority may, if it wishes, arrange for treatment at a doctor's surgery.

Every local education authority—under the Act the county and county-borough councils—must now work out a scheme to cover the full range of hospital and clinic treatment. The existing clinics for minor ailments, defective hearing, diseases of the ear, nose and throat, and eyes, orthopædic cases, dental treatment, child guidance. speech therapy. and rheumatism, which have been further developed in some areas than in others, must be revised and where necessary extended and strengthened. This will mean securing the services of more consultants—aurists, ophthalmic surgeons, dermatologists, and specialists in children's diseases. Another necessary reform, not mentioned in the circular, is the desirability of all whole-time medical personnel in the school medical service undertaking active duties in a children's department of a hospital for some part of their time, whether as a clinical assistant to the hospital pædiatrician or as a registrar with beds to supervise. Arrangements for hospital treatment are to be comprehensive provided it is confined to children referred to the hospital by the education authority, or children for whose treatment the authority has accepted responsibility. Authorities are likely to vary in the way they go to work under this definition, but two things seem desirable. First, having established its scheme, the authority should authorise private doctors to send any child who comes within its scope direct to a hospital or clinic for treatment, without any formal acceptance of each case, which would cause delay and irritation. Secondly, in framing its scheme the authority should specify hospitals at which treatment can be given at the authority's expense; clearly not every hospital is staffed and equipped to deal with all conditions, and the authority must ensure that children requiring special treatment do come under the care of a specialist. The circular suggests that in rural areas without clinic facilities arrangements should be made with local general practitioners to treat children referred by school medical officers or nurses, either in the schools or in the doctors' own surgeries; it is not clear how this will work out when the family doctors practising in an area are not in partnership. The same arrangement is suggested for dental treatment in areas where clinic facilities are lacking.

While the war lasts. and for some time afterwards, progress towards a comprehensive medical service for children will unavoidably be restricted by the shortage of civilian doctors. dentists, and nurses; and when a National Health Service is in full swing the children's service will be absorbed into that. But in issuing their circular the Ministry of Education are clearly encouraging local authorities to make the best provision they can for children in the interim period.

SHOCK TREATMENT AS AN EXPERIENCE

THE doctor cannot explain how physical methods of treatment can restore a patient to sanity; neither can the patient give a clear account of the change that has meant so much to him. At a meeting of the section of psychiatry of the Royal Society of Medicine on March 13, Dr. J. Frank described what he has been able to discern, either from patients' reports, or from his own observation, of the experience of those undergoing treatment by artificially induced fits or prefrontal leucotomy. Pharmacological shock, by insulin or leptazol, and electrical convulsion therapy (ECT) are being given on an increasing scale, not only for psychosis but for psychoneurosis; and prefrontal leucotomy is being tried in cases of hypochondriacal neurosis, severe obsessionalism, and [illegible] y. The fact that the same [illegible] may bring a change for the better in the manic-depressive, the schizophrenic, and the neurotic. means. he suggested. either that there is some common denominator in these conditions or that the change is due to the subject's experience of the convulsion.

In 650 cases treated by ECT at Graylingwell Hospital the best results were obtained among those depressives who showed a common denominator in physical signs such as motor retardation, loss of weight, anorexia. insomnia, and constipation. Conscious reactions among these patients were scanty. They were a little confused for an hour or two after the fit; and if the confusion lasted longer than that he suspected cerebral arteriosclerosis. They had little deep insight into their previous condition: "I don't know why I felt like I did, or thought such terrible things; but I'm all right now, and know my thoughts were wrong." Dr. W. Mayer-Gross, touching on this point in the subsequent discussion, remarked that the rational conscious insight of depressive patients is good. The treatment changes them. and after the change they are naturally unwilling to dwell on their former condition. Certainly deep analysis is out of the question soon after treatment, being liable to provoke a relapse. As Dr. Frank pointed out, the doctor must accept a paradox: before treatment the depressive patient cannot be analysed because he is incapable of transference, and after treatment he is capable of transference but cannot take the strain of analysis. His doctor's task is thus only to provide him, during recovery, with as apt an environment as possible, both in the wards and after discharge. A good group spirit in the ward, and association with other recovering patients, will do much for him.

Retrograde amnesia covers the short preconvulsive aura in ECT; nevertheless all patients dread the fits—depressives. however, less than psychoneurotics. Yet fear of the fit cannot of itself be held responsible for the improvement, as Dr. L. C. Cook made clear in the discussion. In 275 cases he had assessed overt apprehension, and found that out of 11 showing gross fear, only 1 improved; of 56 showing moderate fear 18 improved; of 61 showing little fear 21 improved; of 95 showing a normal reaction 47 improved; and of 52 showing undue indifference 24 improved.

Maniacal reactions after the fit are uncommon in depressives, Dr. Frank said, though many have a sense of euphoric well-being—which they do not usually connect with the treatment unless the idea is suggested to them. Little as they like the fits, they turn up regularly for them. as outpatients; whereas psychoneurotics tend to fall off. He found no evidence, in the dreams or fantasies of depressives, to indicate that this perseverance sprang from a desire for self-punishment: on the contrary, after 4 or 5 fits their sleep became restful instead of disturbed, whereas psychoneurotics often had nightmares of train crashes, flood and fire, which might be a compulsive recapitulation of the fit itself.

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[1] See *Lancet*, 1944, i, 153.

Recovered depressives are apt, he finds, to express their gratitude for convulsion therapy with a good deal of shallow and insincere politeness. He puts this down to a "fading of colour" of the personality comparable with that seen after leucotomy and severe organic deteriorations, but with the difference that after a couple of months the dimming effect of ECT passes off, and the personality recovers normal vividness. Depressed patients treated with leptazol are able to recall terrifying preconvulsive auras of annihilation which seem to last endlessly, though in fact they occupy only 15–30 sec. These patients often mime repressed memories immediately after the fit, but this, he finds, does not help them: they are not suited for the conveyor-belt of fit treatment.

Insulin treatment produces a curious type of awakening in about 80% of patients: they talk in an infantile manner for a time, and seem to recapitulate the early phases of emotional development. He spoke of the "warmth and congruity of affect," produced by insulin coma in nuclear schizophrenics, as a remarkable achievement.

Experience of leucotomy is especially odd: even in patients of high intelligence with well-preserved personalities, the operation seems to have less subjective significance than an appendicectomy. A doctor and a medical student so treated had little notion of the theory of the operation, or even its site, though they had discussed it beforehand, and saw the scars daily. Dr. Mayer-Gross suggested the need for animal experiments in the further study of these methods of treatment; but no-one raised the question of human volunteers of normal mentality. It might be difficult to find candidates for leucotomy, but some normal opinions about the effects of induced fits have already been recorded.

BLOOD IN THE EYE

After a blow on the eye with a blunt object it is not uncommon to find blood in the anterior chamber. This blood comes from a ruptured iris vessel, and the hæmorrhage may be repeated in a few days. Blood-cells normally leave the anterior chamber by entering the iris crypts, and thence by way of the iris stroma reach the suprachoroidal lymph-space and vorticose veins. In a slight hæmorrhage all the blood may have left the eye by this means in a few days, but if the blood is sufficient to raise the tension of the eye this normal line of evacuation will be closed owing to pressure against the unyielding fibrous tunic of the eye, and blood-cells or their remains may be driven between the corneal lamellæ to form blood-staining of the cornea. This is a serious affair, for such staining only clears very slowly if at all, and an eye so affected will certainly not regain its sight in less than two years.

Philps[1] has shown that blood-cells, if not evacuated from the anterior chamber, may remain there intact for months or even years; and this is not surprising, for aqueous humour and blood plasma do not differ greatly in their composition. Where the iris crypts have been destroyed or become blocked by inflammation blood-cells leave the anterior chamber slowly if at all, and do not travel by the canal of Schlemm in any quantity. Unless the hæmorrhage is very small the blood clots, and then the process of removal cannot begin until the fibrinous elements entangling the cells have been dissolved by the aqueous humour.

Rychener[2] advocates paracentesis of the anterior chamber in every hyphæma which completely fills it. It is not necessary to evacuate the blood-clot; indeed it is unwise to make too strenuous efforts to do so; and the lessening of the ocular tension produced by the operation will have the desired effect of re-starting evacuation of blood-cells by the normal route. In 13 patients with traumatic hyphæma and raised intraocular pressure Rychener has now used this treatment with satisfactory results. Formerly atropine has been used in these eyes to ward off the accompanying iritis, but there is a good case for using a miotic such as eserine instead. The increase in tension caused by the blood is further augmented by atropine, and in addition the surface area of the iris—and therefore its power to absorb blood-cells—is diminished by this drug. It seems therefore wiser to use eserine until the blood is absorbed, and then atropine until the eye is white.

NORWAY'S DELINQUENT CHILDREN

Some of the trials of community life are universal, and among them the child corrupted by evil communications is specially disquieting. Remedies have varied in different times and places: the Greeks, with some prejudice, killed Socrates; savage tribes, without prejudice, kill the child; while modern civilised opinion is in favour of changing the teacher and giving the child a fresh start. An account, by Ragna Hagen,[1] of Norwegian ways of dealing with neglected and problem children has some pointers for us. The opening quotation is significant:

> "It is curious to note that it is precisely the turn of the century—that is to say, the time when the care of neglected children by Child Welfare Councils was first instituted—which seems to have brought a change for the better in criminality among young men."—Norwegian Criminal Statistics, 1923–24.

The law which set up these councils, passed in 1896 against much opposition, stopped the punishment of children by ordinary courts of law: instead, those who committed punishable offences were to come under the care of a welfare council composed of the local judge, a member of the clergy, and five men and women elected by the municipal council of the district. In the larger districts several doctors and clergymen may take it in turn to serve, according to the chairman's direction. There has been a growing movement, in recent years, to include in the councils young men and women with modern training in the treatment of children. The councils conduct their investigations in private, no press reports being allowed. They are intended to prevent crime and to alter conditions acting unfavourably on the child. Before the meeting the child's home conditions are studied by a member of the council and a permanent secretary; this corresponds to the study made by the probation officer for children's courts in England. Reports are obtained from the police, the school, and the poor-law relief authorities, and the council member visits the home and tries to get at the root of the trouble by talking to the parents and the child. Often the family needs direct help—better accommodation, or work for the father. In 1939, among 959 cases (affecting 1668 children) dealt with by the councils, home conditions were wholly or partly to blame in 565.

Legally the councils have jurisdiction over children up to the age of 14; but in practice it is customary to leave the treatment of all children up to 18 in their hands. They have several ways of catering for the needs of children brought before them. They can supervise them in their own homes, place them with a responsible family, or send them to a residential home. If the child has committed a punishable offence he can be sent to a school home—presumably corresponding to our approved schools—of which there are four for girls and seven for boys in Norway. Further, children aged 7–15 can be sent to institutions with the forbidding name of "coercive schools" for up to a year; after that they either go home, or, if they need further discipline, to a school home. The results seem to resemble those of English approved schools. Nothing unfavourable is heard of 85% of girls after they leave school homes; the percentage of equally successful boys is stated to be lower. A Home Office inquiry made before the war showed 84% of children leaving our approved schools were satisfactory three years after leaving. It would be interesting to know whether the proportion of children committed to the Norwegian schools by the child-welfare councils corresponds to the proportion sent to approved schools by our own children's courts.

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[1] Philps, S. *Brit. J. Ophthal.* March, 1940, p. 122.

[2] Rychener, R. O. *J. Amer. med. Ass.* 1944, 126, 763.

[1] *Howard J.* 1944–45, 6, 187.

THE NURSE'S PENSION

THE reforms needed in the nursing profession are subject to much debate, but on one point all authorities agree—the nurse should have pension rights, and these should be interchangeable when she transfers her service from one employing body to another. The committee which has just reported[1] has had these aims. An estimate of the numbers to be covered puts the total of all nurses and midwives in England, Wales, and Scotland at 140,421. Of these, at the time when the figures were compiled, 91,427 were working in hospitals (whether as students, assistant nurses, or fully trained staff), 25,983 were working outside hospitals (including 15,222 in private practice), and in addition there were 16,483 midwives and 6528 health visitors. It has been thought necessary to leave out private nurses and industrial nurses from the scheme recommended, nor are nurses in the Services considered. The report reviews the two main existing superannuation schemes—the Federated Superannuation Scheme, operating in those voluntary hospitals which choose to apply it, and the Local Government Superannuation Scheme, which is compulsory in all local-authority hospitals. The committee thinks it impossible at present to provide a comprehensive scheme to supersede both of these, but one member dissents from this view, and Prof. T. M. Taylor, chairman of the Scottish committee, says that he accepts the report with reluctance, in the hope that it will be replaced by more satisfactory proposals later.

The report recommends that the local-government scheme should be left unchanged, but that a separate fund should be set up to cover all nurses and midwives in voluntary hospitals and institutions where the Rushcliffe and Taylor salary scales have been adopted. These nurses would be obliged to join the fund unless they were already contributing to the Federated Superannuation Scheme, and chose to remain under it; this scheme would also remain available for nurses outside the scope of the new fund. Plans have been made by which a nurse who changes from voluntary to municipal service, and vice versa, shall not suffer loss of pension; and the benefits offered are similar to those of the local-government scheme.

> A nurse will qualify for a pension after a minimum of 10 years' contributing service. She will have the option of retiring at 55, or after 30 years' service; and retirement will be compulsory at 60. The pension is to be based on the average salary and emoluments of the last 5 years of service, and to be at the rate of $\frac{1}{60}$th for every year of contributing service. Pensions are to be paid for permanent incapacity on the same basis as for age provided the nurse has completed 10 years' contributing service.

In a series of examples at the end, the report indicates how the scale will work out in various cases. Thus a nurse who qualifies and remains a staff nurse all her life —an exceptional case—will get a pension of about £140 a year if she retires at the age of 55; if she had become a ward sister at the age of 30 she would get about £173 at 55; if she rose to the position of matron she would get £365. These pensions are not dazzling; but they may well be the best that can be managed at present. The nurse is not being rewarded according to the deserts of a life of hard work and little leisure, but only according to the standards which our confused economic system allow. In suggesting that calculations should be based on the last 5 years' salary, rather than on contributions made, the committee has chosen a method which will encourage nurses to leave the position of ward sister for better-paid posts, and in this the report follows the trend of all the Rushcliffe and Taylor reports, which have consistently slighted the most important office in hospital nursing.

CONGENITAL DEFECTS OF THE PERICARDIUM

DEFECTS of the pericardium are among the rarer of the congenital defects of the heart; less than 60 cases have been recorded and 7 of these were in monsters. Sunderland and Wright-Smith[1] report 2 more, neither being diagnosed during life. One was a child of two years who died suddenly; at necropsy a large defect was found in the left side of the parietal pericardium, and death was due to herniation of the heart through this defect; in addition there was a patent ductus arteriosus. The other was a man of 61, who died of bronchopneumonia after a hemiplegia; necropsy revealed a large defect of the pericardium, and the right lung was found to have four well-defined lobes. It is generally accepted that these defects are due to obstruction of the normal development of the pleuropericardial membrane, but there is considerable difference of opinion as to the precise mechanism whereby this takes place. Sunderland and Wright-Smith suggest that one or more of several factors may be responsible. Premature or abnormal enlargement of the heart before the closure of the pleuropericardial foramen would prevent closure of the foramen by herniation of the heart through the opening. If there is an abnormally large foramen when the heart starts enlarging normally the foramen will not have an opportunity of closing subsequently. Delayed or arrested development of a normal pleuropericardial foramen may occur, either from defective formation of the pleuropericardial membrane as a result of premature obliteration of the duct of Cuvier, or from diminished activity of the differential growth factor by which the connexion between the pleural and pericardial cavities is gradually reduced to a minute foramen. Rusby and Sellors,[2] on the other hand, in reporting a case in a girl of 19 in whom the left-sided pericardial defect was accompanied by a solitary bronchogenic cyst on the same side, consider that the association of these two defects supports the view that the pericardial defect is the result of abnormal development with premature atrophy of the left duct of Cuvier.

Males have a congenital pericardial defect three times as often as females, and according to Southworth and Stevenson[3] it has no appreciable effect on the expectation of life. In only one case, apart from the one recorded by Sunderland and Wright-Smith, could death be attributed to the defect; this was a case described by Boxall[4] in a woman who died suddenly three days after parturition, in whom necropsy demonstrated a pericardial defect through which the heart had herniated and become strangulated. Excluding cases where enlargement was due to associated cardiovascular disease, the heart is recorded as being enlarged in about half the cases. The condition seldom gives rise to symptoms, but in cases where there is a common pleuropericardial cavity on the left side (the common side for the defect) unexplained displacement of the heart to the left and abnormal mobility of the heart may be helpful in diagnosis, especially if in addition there is unexplained cardiac enlargement.

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[1] Nurses and Midwives Salaries Committees (England and Scotland): Report of Joint Superannuation Subcommittee on Superannuation of Nurses and Midwives. Cmd. 6603. HM Stationery Office. Pp. 51. 9*d*.

[1] Sunderland, S., Wright-Smith, R. J. *Brit. Heart J.* 1944, 6, 167.
[2] Rusby, N. L., Sellors, T. H. *Brit. J. Surg.* 1945, 32, 357.
[3] Southworth, H., Stevenson, C. S. *Arch. intern. Med.* 1938, 16, 223
[4] Boxall, R. *Trans. Obstet. Soc., Lond.* 1887, 28, 209.

Special Articles

BICENTENARY OF J. P. FRANK

ON March 19 just 200 years ago was born Johann Peter Frank, famous in his own day as clinician, teacher, medical organiser, and physician to three emperors, but [illegible] as the founder of social [illegible] g of which occupied the [illegible] working life, is entitled [illegible] 'icinischen Polizey* and appeared at intervals from 1779 to 1827, in eleven volumes, the last two supplementary volumes being published posthumously. In it he laid the scientific foundations of public health and its independence as a subject of medical education. Professor Mackintosh,[1] in his inaugural address at the London School of Hygiene and Tropical Medicine last June, pointed out that Frank's influence had some part in the foundation of the first chair of public health in Great Britain, at Edinburgh in 1803. The *System* is written in Frank's mother-tongue, German, but he prepared the way for it in three short Latin treatises, all of which have been translated into English for the first time within the last 10 years.

In the first of these, *Epistola invitatoria ad eruditos, de communicandis, quae ad politiam medicam spectant, principum ac legislatorum decretis*, Mannheim, 1776, translated by Barnard,[2] he outlined the plan for his work and invited learned men throughout the world [illegible] government decrees [illegible] treatise, *Dissertatio* [illegible] Göttingen, 1784, [illegible] nds his theory that the civil administrator by appropriate legislation can achieve for the public health what is impossible to the physician. The last of this trio, *Oratio academica de populorum miseria, morborum genetrice*, Pavia, 1790, translated by Sigerist,[4] is a stirring exposure of the poverty and wretchedness of the populace in his own time and the influence of these conditions in the causation of disease. These three treatises give us an indication of the idea underlying the whole of his great work, an [illegible] stated in one sentence in [illegible] Diese hingegen giebt sich [illegible] mehr vergebliche Mühe, und verwendet mehr Geld in einer Woche, als von beyden nöthig wäre, dem Uebel durch kluge Ordnung vorzubeugen" (It [the government] at present, in order to get help [in curing disease] gives itself more vain trouble, and spends more money in a week, than would be necessary to prevent the evil by wise ordinance).

A GROWING REPUTATION

References to Frank in the medical literature of the last two centuries give some indication of the changing fortune which his reputation has undergone. They numb[illegible] essive tribut[illegible] they consis[illegible] views of his published work.

In the 40 years following his death in 1821 we have found only eight, one in Italian, one in French, the remainder in German, almost entirely biographical in nature. The next 30 years produced over a dozen, all German, mostly dealing with special aspects of Frank's work, such as glycosuria and his theory of the vertebral nature of the skull. Public health *also appears for the first time.* In the last decade of the 19th century there appeared three contributions, one each in German, Russian, and French, the [illegible] birth [illegible]

[illegible] century are all in German and discuss a variety of topics: hygiene, neuropathology, and eugenics, besides the more personal aspects. In the 1920's there was a sudden increase of interest in Frank, and English contributions (two American and two British) appear for the first time among the seventeen items of this decade. There are also two in Italian and one in Russian. All are of a general or biographical nature. From 1930 to 1939 there are no less than twenty-one references, including four English (two American, two British), mostly biographical, but some also of public health interest. Since 1940 there have been at least three references in the English literature: owing to war conditions we cannot be sure what has appeared on the Continent.

We see therefore that it was nearly 80 years, judging by the literature, before Frank's significance in public health was recognised, and a full century before his fame spread t[illegible] Now that his name app[illegible] ne round the walls of th[illegible] Tropical Medicine it is [illegible]

THE REFORMER

Only a few of the innumerable proposals that crowd Frank's pages can be mentioned here. He was a great believer in vital statistics at a time when they were almost unknown. All births and deaths were to be registered and the causes of death classified. Surveys were to be made of the prevalence and geographical distribution of poverty and disease, and the interrelations of the two studied. In his proposals concerning marriage Frank was a pioneer of eugenics. Many of them are still too "advanc[illegible] today —e.g., the legal [illegible] it also of maximum age [illegible] narital examination, and [illegible] those afflicted with hereditary diseases. Marriages of free choice between well-matched and healthy couples were to be encouraged and their prohibition by parents made illegal.

The reform of midwifery being one of the outstanding practical achievements of Frank's life, his suggestions in this and the related subject of infant welfare are naturally detailed and well founded on experience. All pregnancies were to be registered and "follow-up" records kept; breast-feeding, in the absence of any [illegible]; and all infants [illegible] to be inoculated [illegible] before Jenner's [illegible] ygiene was also very thoroughly handled: school hours to be restricted, and the size, situation, heating, ventilation, and illumination of school buildings controlled. Proper sanitary conveniences were to be provided.

Frank recognised the evils of intemperance but did not advocate total abstinence. Inns were to be inspected and the manufacture and sale of intoxicating liquors controlled. Drunkenness should be a punishable offence and the use of tobacco prohibited before the 20th year. Writing a century before Pasteur, Frank deplored the fact that the true nature of infection was still unknown. His section on communicable diseases is in consequence unsatisfactory, but his proposals on the subject of food inspection are probably more in line with modern [illegible] ess extent the [illegible] water-supply. [illegible] 18th century, favoured a benevolent despotism as the ideal form of government, and the growth of democracy has made many of his proposed laws impossible to enforce in the somewhat naïve forms he suggested, it should not be forgotten that it was he who originated the idea of improving the public health by the method of wise legislation.

C. C. B.

MEDICINE AND THE LAW

Unlicensed Establishment for Diathermy Treatment

SOME day, when the Ministry of Health has time to turn from large-scale legislative problems of local [illegible] to the minor adjustments [illegible] ocal restrictions on estab[illegible] athermy treatment might [illegible] country. At present the big towns, and a few county councils like that of Middlesex, purchase the right to control them by way of a Local Act procured at the expense of the ratepayers. Meanwhile in those areas where the law forbids such establishments anyone who infringes the law is unlikely to be doing so in ignorance. Recently, on summonses by the London County Council, Henry Lewin and Louis A.

[illegible]

Newton, MRCS, trading as the "Newin Clinic" at 48, Portland-Place, London, have each been fined £10, with ten guineas costs, at the Marlborough Street police-court, for carrying on an establishment for short-wave diathermy for deafness without an LCC licence.

Mr. J. S. Atherton, prosecuting, mentioned that in September, 1942, Dr. Newton was found guilty by the General Medical Council of giving false certificates to enable three persons to evade their obligations under the National Service (Armed Forces) Act, and his name was erased from the Medical Register. In January, 1944, Mr. Lewin wrote to the LCC notifying his intention to reopen an establishment in London in partnership with a doctor not then on the Register, and he asked about their position with regard to a licence. A form was sent to him and in February the two defendants applied to the Council for permission to give electrical treatment, light and other baths, and long-wave and short-wave diathermy at Portland Place. They were informed that the Council were not prepared to grant permission, and they withdrew their application. Later advertisements appeared in the press, announcing that diathermy treatment would be given at the clinic, and when the defendants were interviewed they admitted that they were giving 40–50 treatments a week, and said that as they were not giving massage treatment they were advised that the LCC had no authority over them. Mr. Atherton added that Mr. Lewin had previously had clinics at Cheltenham and other towns.

Mr. Edgar Rodwell, the solicitor defending, urged in extenuation that they had been advised that as Dr. Newton had medical degrees, although he was not on the Medical Register, it was not necessary to apply for a licence. Mr. Walter Hedley, KC, the magistrate, said it was quite obvious that they both knew they had to be licensed and that they wilfully disregarded this fact because they could not get a licence. At the same time, as there had been no complaints about the clinic, he should treat this as a comparatively minor matter. If the offences were repeated he would have to take a more serious course.

Judicial View of Lax Certification

In 1941 a woman wanted to leave her employment at the Clyde Rubber Works in Scotland and, for this purpose, asked a doctor for a medical certificate. He gave her a certificate to the effect that she told him she suffered from frequent sickness on account of the nature of her work and that he himself had no reason to doubt what she told him. On this the national service officer gave her permission to leave her employment. Soon afterwards the managing director of the rubber works wrote a letter to the doctor which the doctor alleged to be defamatory. A few days later an appeal board recommended that the national service officer's decision should not be accepted; the permission to leave was withdrawn and the woman went back to her old work. The doctor claimed £500 damages from the managing director in respect of the letter; he contended that it contained a malicious accusation of something amounting to treason, since in effect it charged him with being party to a course of conduct which sabotaged the war effort. The sheriff-substitute at Paisley (a tribunal roughly corresponding with a county court in England) dismissed the claim for damages. He held that the writer of the letter had acted without malice and that the occasion was privileged. Incidentally he criticised the certificate given by the doctor as well as the medical evidence tendered in support of the claim at the trial.

On appeal to the Court of Session in Edinburgh, the Lord President upheld the opinions and the decision of the court below. He agreed that the letter substantially complained of loose practice rather than of deliberate purpose. The Lord President added that he appreciated that in 1941 doctors were over-driven and harassed by applications for medical certificates on behalf of persons who were trying to escape from the duties imposed on them by the country's necessities. Apparently some practitioners had slipped into a loose way of granting certificates which were not in accordance with their usual and better considered practice. "I am glad to say," observed the Lord President, "that the medical profes- on at large became aware of this unfortunate develop- ent, and steps were taken to rectify it."

In England Now

A Running Commentary by Peripatetic Correspondents

Prof. L. J. Witts, broadcasting on March 11 abou fibrositis, told us how, after recovering from a cold, h went to London and got food-poisoning, and, recoverin from this in bed beside an open window on his left, forgo the draught until he developed a pain in his left shoulde There, he suggested, you have all the ingredients of a attack of fibrositis. Then he reminded us that Pettenkofer drank a culture of *Vibrio choleræ* and did not ge cholera; so a susceptible person is also required. Witt then remembered that others of his family have ha rheumatism and discussed the incontrovertible fact o hereditary predisposition. Under the comforting influence of radiant heat he also remembered that some thin the mind is a factor in the causation of disease. Though and emotions, he seemed to agree, are causes, though nc the only ones, of illnesses such as hysteria and morbi anxiety; but he found it hard to believe that structur changes in the body can be brought about by the min Between these two extremes, however, there are diseas which many believe to be affected by the mind; such a eczema, asthma, and rheumatism. He mentioned tl views of J. L. Halliday (see *Brit. med. J.* 1937, i, 213, 264 who collected a series of cases of fibrositis of the neck an shoulder, mostly on the left side, and maintained that tl left side is associated in the collective unconscious wi disaster and misfortune, and in saga and myth with tl magical and demoniacal, while the right signifies tl good. Pain in the neck, says Halliday, may mean, in psychoneurotic person at any rate, "I cannot bow m head to this"; lumbago may mean, "I do not stoop to c these things"; generalised pains and stiffness may mea "*I am sore about what has happened to me.*" Grie whose physical manifestations are temporary, ma persist in some individuals so that the chokings and sol become asthma and the soreness and stiffness becon rheumatism. Witts remembered that a childhood frie had recently died and another friend had broken h arm; but he found it hard to believe that the mind cou affect the cells concerned in fibrositis or determine tl point of attack of that disease. And any bookie listeni would, I feel sure, have offered 100 to 1 on the draugh

* * *

I was lucky enough to be taken round the notorio "torture-camp" of Breendonck by a prominent Belgi editor who had himself spent over a year there as prisoner, on the (justified) suspicion of being a pow behind several clandestine newspapers of the "Resistance."

The camp is in one of the underground 18th centu forts which constituted the outer defences of Antwer even in the last war. The approaches contribute an appropriately macabre background to what was only a month or two ago one of the blackest spots on the "civilisation" of Europe. After passing through several lanes of electrified barbed-wire we crossed the moat by the ancient drawbridge and passed down the narrow, almost dark, cobbled corridor which leads at a gentle angle down into the centre of the fort. On either side of this are the guard-rooms and the stone-flagged unheated rooms, each of which held fifty or more of the luckier political prisoners. Further on are the solitary cells, each measuring 5 × 4 feet, in which were confined those under interrogation or condemned to death. These have no communication with the outside ligh or air.

My friend then led the way to the torture chamber, a large room with damp stone walls and no windows. There were no furnishings other than the long wooden table on which he had himself been beaten, a hook in the ceiling, and a narrow channel in the floor which he said was to carry away blood. The hook was to support a rope by which prisoners who refused to talk were suspended by their wrists, which were first passed backwards between their knees so that they hung head downwards. This permitted them to be dropped suddenly on to their heads as often as their interrogators wished. For the usual preliminary "aid to conversation" however no apparatus was necessary, since it consisted in pushing a sharpened match-stick under each finger-nail and allowing it to burn down.

Full confirmation of these and other gruesome details came unexpectedly while we were still in this chamber in the form of a "pilgrimage" of some thirty or forty "old boys" of this prison, all employees of the State postal service who had been caught or suspected of tampering with the Gestapo's mail. As they had mostly known my companion, there was an orgy of hand-shaking, embracing, chattering, and even weeping, such as can seldom have been known. It seemed evident that the old-school-tie spirit is in essentials the result of unpleasant experiences shared in the past, and that any class association is probably incidental rather than fundamental. This may perhaps explain why it seldom affects the product of schools, such as those provided by a benificent State, in which corporal punishment is frowned upon.

We spent an hour with these newcomers, listening to their reminiscences and looking at their photographs. Dysentery they told me was rife, but the prison rule of a visit to the lavatory twice a day only was never relaxed, and when they died, as they often did, their soiled clothes were handed on to new entrants in the state in which they were left. Apart from prisoners officially condemned to death, fifteen chosen by lot were in addition shot every week *pour encourager les autres*; and my host's 12-month sojourn was therefore, they assured me, almost a record.

Leaving, we passed the courtyard at one end of which still stand five railway sleepers to which victims were tied to be shot. In one corner stands a gallows. Looking back across the moat at this horrible place there was a sudden flash of blue as a king-fisher skimmed past, and I think that we were both grateful for this relief.

The full story of such places will never be fully believed by the good-natured peace-loving people of Britain—whose country has never been occupied. Perhaps it is as well.

* * *

Mess life has varying effects on the habits of the individual. At times for weeks on end he will seize a particular armchair and solemnly read through a set series of periodicals; at others he will haunt the billiard-room, occupying, or interminably waiting for, one or other of the tables, or perhaps knocking up at table-tennis to fill in the gap. But recently a long-forgotten warped shove-ha'penny board was found in a drawer of a condemned table. Someone produced five ha'pennies of the same vintage and had them "faced up" in the workshops. Someone else cleaned the board with ether and disclosed a beautiful piece of even-grained teak. The carpenter's shop levelled it and made a cover—and we were off.

I don't know by what mechanism, and prefer to think that the g [illegible] physician played its part, [illegible] ayers were found among th [illegible] remacy has never seriously [illegible] veryone from the CO downwards has made an attempt, and we are now generally left alone to play each other. An education officer put his own special seal on the matter by organising a knockout competition on handicap. This teacher's zeal to examine our competitive spirit was, remarkably enough, well received—particularly as a sweep was include [illegible] at shove-ha'penny, but we [illegible] Did you know there is a S- [illegible], the AFA or NFA? The semi-finals and finals were incredibly played under verbal fire of pretty nearly the whole mess. Excitement at times was intense, and the last successful ha'penny finding its snug place fairly between the lines was a welcome relief suitably displayed in the applause. Modesty as well as anonymity forbid naming the victor.

But our educational friend had not exhausted his schoolmastering passion for exciting competition, and instituted a shove-ha'penny "ladder." Our lunch hour is now fervid with strife, and men with knitted brows and scornful expressions (when viewing the flukes of their opponents) are always to be seen standing round the table bearing the shove-ha'penny board. I often wonder what visitors must think of the solemnity with which we attach ourselves to these five coins of low degree and a piece of wood; but I cannot feel that our behaviour is more feeble-minded than that of the rest of the world, where mutual extermination, in however just a cause, is the main preoccupation.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

THE address delivered by Mr. Churchill to the Conservative conference brings the time and method of a General Election into clearer focus. We may, according to the Prime Minister, achieve complete victory over Germany by the summer or earlier. An election will follow that victory. There will be an interregnum when Labour and Liberal members of the Government withdraw from the Coalition and Mr. Churchill forms an interim Government to carry on until the election has been held; and in this Government Mr. Churchill will seek the help of men outside the Conservative party, or outside any party. He clearly hopes that the Conservative party, getting the majority of seats, will be able to carry on some kind of coalition in the future. The basis of this coalition would be the Four Year Plan announced by the Premier some two years ago which includes the projected Social Security legislation and the National Health Service. As these projects will certainly be included in the Labour programme if Labour is victorious the nation seems now to be pledged, whatever Govern- [illegible] Beveridge, with [illegible]

[illegible] nt was Sir J. [illegible] stimates. He [illegible] all our Forces, [illegible] Italy, he said [illegible] Army has perfected itself by a long process of rigorous training and is equipped as no Army before. Confident in its own strength "it is assured of final victory both in the West and in the East."

It was made clear that after the war with Germany is over there will be substantial demobilisation, but also a very complicated and difficult process of redeployment [illegible] by a further call-up of those [illegible] reserved occupations. Mr. [illegible] member, revived the general demobilisation issue in an amendment—a usual formula on the Service estimates—and asked for an advisory council of 5 officers and 10 ORs to be set up to help in fitting men into useful employment. The War Office cannot, he argued, on demobilisation, "pass the buck" to the Minister of Labour and say that the demobilised are no longer their concern. The War Office should be sure that there is a job to which the demobilised man can go.

In replying on the amendment Mr. Arthur Henderson said the principles of demobilisation depended on the objective standards of age and length of service. But retention on grounds of military necessity will override both age and length of service. He was interrupted to be asked whether "military necessity" would not adversely affect the chances of demobilisation of medical officers "as they are very scarce." And further as to whether he would make some adjustment to the scheme [illegible] medical [illegible] promised to have " [illegible]

Sir J [illegible] debate, said he had been re [illegible] he had left unsaid and und [illegible] ibute to the doctors and medical services. Speaking of the recent award of a posthumous VC to a lance-corporal of the RAMC he said, "I do not remember ever reading anything more heroic." There is no doubt, he continued, that the medical services "have been beyond praise in this war and the number of lives and limbs saved by doctors is almost beyond measuring."

FROM THE PRESS GALLERY

Guns or Butter?

IN introducing the Army Estimates in the House of Commons on March 13 Sir JAMES GRIGG, Secretary of State for War, said he would like to make clear to the House what were the military responsibilities for feeding the civil population in the liberated countries. The military authorities had come into this business, he said, for two reasons. First because the Commander-in-Chief must assure himself that his operations would not be hampered by disease and unrest among the civil population caused by lack of food and medical stores. Secondly because in the early phases of operations, the imports necessary to prevent disease and unrest must come as part of the military flow of supplies. It could not be a question of what we should like to give our Allies but of the utmost that could be procured and shipped in competition with military requirements not only in the theatre but all over the world.

Plans to supply the American Supreme Commander's needs in this respect had been worked out on a joint basis between Washington and London. Canada too had been closely associated in the provision of the supplies, and substantial contributions had been made from the stocks of the Ministry of Food. Over 300.000 tons of food for the relief of France, Belgium, and Holland had been provided since the beginning of operations in Western Europe, and deliveries were now averaging at ports in France and Belgium some 7000 tons a day. In Greece, up to the middle of February, the military authorities had provided between 150.000 and 200.000 tons of food, and in Italy, up to Dec. 31, about 1 million tons. But the provision of supplies was not enough to enable the people to be fed. In France, for example, the shortage and dislocation of internal transport had prevented uniform distribution. That shortage was, he hoped, being overcome, but he feared that when the parts of Holland now occupied by the Germans were freed there would be grave problems not only of internal communications, flooding, and mines, but also of shortage of local products to help out the imported supplies. And though we had got so far without disaster, he did not conceal from the House his fear that in the coming months the demands for foodstuffs for the liberated countries might become almost overpowering. In Germany itself there would be displaced persons not by their thousands but by their millions, who would look to the armies for food. The combined resources of the Allies might be strained to the utmost to prevent hunger and indeed starvation, especially if our victory came before the new harvest was gathered. The armies would do their best, but he must stress the magnitude of their task. It was only right that the military should shed these responsibilities in this matter as soon as the military situation permitted, and they were anxious for the governments concerned to take over the obligation for the procurement of the basic supplies, and to push on with the civil import programmes which would enable them to re-start their industries.

UNRRA was an organisation which he hoped would bring to post-war Europe material and moral help and support, but, broadly speaking, this help would come after the main military work was done at the invitation of the indigenous governments. During the military period, however, UNRRA might, by mutual agreement under the direction of the military authorities, carry out tasks which would otherwise fall on the military. Thus in Greece UNRRA teams assisted in the distribution of the food which the military brought in, and arrangements were being made gradually to hand over to UNRRA the whole relief scheme in Greece. It was hoped that UNRRA teams (recruited from representatives of various United Nations) would go into Germany under the military authorities to organise the reception, care, and repatriation of the displaced persons, and ultimately to take over the entire responsibility for them.

In the debate Dr. HADEN GUEST gave an account of his recent visit to the 21st Army Group. The astonishing smallness of casualties, the astonishingly high rate of recovery—by which men not only survived but recovered to pre-wounding condition—was, he said, a tribute to the efficiency of the medical service. It was not only that operations took place very shortly after men had been wounded. The whole method of cooperation of the medical services with the other services was so much closer, so much more on a footing of complete equality, that it had completely changed the health conditions and vitality of the army. The work of the hygiene services in giving the ordinary soldier a knowledge of how to keep himself fit was a wonderful contribution. In the last war the louse and scabies were an everyday affair ; in this they were practically unknown. Men got the tunity to bathe and to change their clothing even under front-line conditions. In spite of adverse conditions trench foot, which was the bane of operations in the last war in Belgium and the Low Countries, for practical purposes did not occur in the British armies today. This was not because of some intervention of Providence, but because of the good organisation of the combatant forces which largely depended on the application of medical knowledge. He had come across an advanced surgical centre where operations were being performed by skilled surgeons, with all the apparatus of a modern operating-theatre and with the help of nursing surgical sisters, within half a mile of the fighting line.

Aids for the Deaf

In the House of Lords on March 14 the Duke of MONTROSE asked what progress had been made by the Medical Research Council towards the supply of standard national acoustic aids for deafened ex-Service men. He moved that in all large cities otological clinics should be set up as part of any national rehabilitation scheme for ex-Service men. He suggested that training centres for the deaf, the blind, and the limbless should be centralised. After this war we ought to be ready to train and treat at least 200,000 deaf cases. There were about twenty kinds of aids for the deaf, but their prices were exorbitant. He was sure that a national standard set could be provided by mass production at £5 and distributed on a national basis.

Viscount CLIFDEN, replying for the Government, said that the MRC electro-acoustics committee, which is investigating problems connected with the design of hearing-aids, would not be able to make definite recommendations until the end of this year. Another MRC committee was considering rehabilitating measures for the deaf. Up to January, 1945, the number of cases of ear disease attributable to service in the armed forces since the beginning of the war was approximately 5000—the Navy 500, the Army 3800, the Air Force 700. Some 65% of these would be unlikely to need lip-reading or hearing-aids. Of the remainder, recommendations by all surgeons for hearing-aids were less than 60 a year. The deafened ex-Service man was covered by the Disabled Persons Employment Act, and aids for hearing and the cost of their upkeep were supplied free of charge. During the past two years 120 had been supplied.

The Duke of MONTROSE said he had never heard a more disappointing official reply and would not withdraw his motion. The Earl of LISTOWEL said it was clear that the Government accepted full responsibility for the deafened ex-Service man, but there were not enough cases to justify setting up a clinic in every large town. The Duke of MONTROSE agreed to amend his motion and the Government then agreed that provision should be made for setting up approved otological clinics as part of any national social rehabilitation scheme for ex-Service men.

Paper for Medical Books and Journals

In the House of Lords on March 14, speaking on Lord Elton's motion calling attention to the lack of paper for books, Viscount BUCKMASTER urged that medical publications, in which he included journals and periodicals, were so restricted that it was difficult to see how the study of medicine could be pursued or how medicine could be practised in the manner which was expected. Two examples from the medical curriculum would show their Lordships that publishers were now quite unable to supply the basic minimum of books needed by medical students. *Gray's Anatomy* was unobtainable either in new or secondhand form. The same applied to *Buchanan's Anatomy* and *Cunningham's Anatomy*. In one physiology class 15% of the students could neither beg, borrow, nor by any means short of theft obtain a copy of any of the leading works. How could men pursue their studies under such conditions, and how could a medical man in practice keep abreast of modern medical knowledge? It was not merely that writers were prevented by the shortage of paper from expressing their views in book form ; the shortage of journals and periodicals was also great. The editor of one of those journals advised him that he had a waiting-list of 1500 doctors seeking to become subscribers, and was quite unable to meet the demands for his journal from the liberated countries. The editor of another assured him that he could not in any way meet the demands of his subscribers, that his correspondents were drastically cut down, and that much medical knowledge of the first importance could not be passed on.

It was not merely the medical man in practice who needed these journals. They were essential to the medical research worker. He must have the power to express his findings as and when he pleases. He must keep in touch with the progress of his fellow workers in this country and abroad, especially in the United States. If he was denied that, some discovery of great benefit to [illegible]

[illegible] published until 1946. How could they continue their work in such conditions? What sort of encouragement was that to give them? If the advance of medical knowledge was retarded the community as a whole was penalised. It was not merely the medical man who suffered, but the whole human race. They got a good example, perhaps in a small way, in the world of social medicine. Here was a branch of medicine which was indeed making great strides: the Goodenough Committee had urged that it should receive every encouragement. Many young and eager men and women were seeking to work in that sphere, yet at this very moment, when one would think that the Government would be anxious to encourage it, the Ministry of Supply had [illegible]

[illegible] figures it was clear that the total demands of paper for the medical world were negligible compared with the amount in daily use. He urged the Government to do their utmost to see whether some additional grant of paper could not be made before we lost ground which could never be regained.

In his reply the Earl of SELBORNE, Minister of Economic Warfare, said that Lord Buckmaster had spoken strongly, and indeed moving [illegible]
cal books. He was advised [illegible]
efforts of the committee p [illegible]
Moberly the publication of medical books at this moment amounted to 80% of what it was prior to control; but if there were the deficiencies which Lord Buckmaster described, he agreed that the matter required the most serious consideration from the authorities, and he would draw to it the attention of the President of the Board of Trade.

QUESTION TIME

Release from Military Service

Rear-Admiral BEAMISH asked the Secretary of State for War if he was aware that a district in Sussex, with a scattered population of some 3000, would be left without adequate medical attention if the sole local practitioner was again called to military service; that the recommendation in September, 1944, by the Central Medical War Committee for release had not been withdrawn by them; and would he now permit this doctor to continue his civil duties.—Sir JAMES GRIGG replied: This doctor was granted three months' release during the winter and the Central Medical War Committee have twice considered representations for an extension of this period of release, but have not seen fit to make any further recommendation to the War Office. The district is part of the borough of Brighton where there are at present relatively more doctors than in *many* parts of the country. In view of the very great need for doctors in the Army I regret that this one cannot be allowed to return to his civil duties.

Colonel R. S. CLARKE: Will the Minister consider whether some of the trained RAMC officers who do administrative work in field ambulances and hospitals could be exchanged for others who could do it for them, so that more doctors could be released?—Sir J. GRIGG: We try to substitute on the administrative side of the RAMC non-medical officers for medical officers as much as possible, but it cannot be done altogether. Mr. RHYS DAVIES: Will the Minister bear in mind that he may be violating the legal provisions of the National Health Insurance Act by not leaving a sufficient number of doctors in certain localities?—Sir J. GRIGG: I confess that that is one of the things which I could not answer off-hand.

Dysentery in Scotland

Mrs. A. HARDIE asked the Secretary of State for Scotland whether his attention had been drawn to the alarming increase in dysentery in Scotland.—Mr. J. WESTWOOD: There has [illegible]

[illegible] cases are of a mild form and involve only a few days' incapacity. The increase began long before the war, and may be partly due to improved methods of diagnosis. During 1944, there is no recorded instance of spread of the disease among the civilian population by food, milk, or water, although the possibility cannot be ruled out.

South African Military Sanatorium

Sir E. GRAHAM-LITTLE asked the Minister of Health whether, [illegible] military sanatorium in Johannesburg with more than 1500 [illegible] scent institutions, he would [illegible] by which tuberculous cases [illegible] reatment were automatically discharged from the services and encourage tuberculous service patients in every stage to seek treatment in South Africa.—SIR JAMES GRIGG, Secretary of State for War, replied: The majority of tuberculosis cases amongst military patients in India and the Middle East are evacuated to South Africa to the South African military hospitals and convalescent depot until cured or until they cease to become infective. This procedure is, however, restricted to those patients whose condition permits of the lengthy sea voyage involved and who are likely to respond to treatment within a reasonable time. Other military tuberculosis cases receive treatment in Army hospitals and if found unlikely to be fit for further service are discharged from the Army and become the responsibility of the Ministry of Health.

SCHOOL FOOD.—Mr. CHUTER EDE said that last October 1,250,000 public elementary school-children were having dinner in 13,150 school canteens. The number of authorities making arrangements for some children to have meals and milk during the holidays were 165 and 108 respectively.

THE MINISTRY ON HOSPITAL FOOD

THE cause of better feeding in hospitals has been well served in a new circular (41/45), to hospitals and sanatoriums, from the Ministry of Health. In it the Minister is concerned primarily with the feeding of staff, but he points out that his recommendations [illegible] force to the feeding of patient [illegible] can rely on hospital authoritic [illegible] oint of view. [illegible]

[illegible] a separate catering department should be recognised, under the charge of a full-time officer, suitably trained, of adequate status, and directly responsible to the chief administrative officer of the hospital. In hospitals of less than 150 beds it may be necessary to combine the duties of this office with those of another, or to arrange for a full-time officer to advise a group of hospitals. The officer, who should be trained in catering and as a rule in dietetics as well (though in the larger hospitals he may have a dietitian working with him), should be responsible for the ordering, the framing of menus, the management of kitchens and dining-rooms and their staffs, the serving of meals, the transport of food to the wards, and the provision of special diets. He should work with a catering committee, specially appointed to represent the various hospital departments, and to ensure their coöperation hospital authorities are advised to review their hospital equipment with a view to bringing it up to date when times allow. The circular twice emphasises the importance of "the full drawing of rations up to entitlement." It is pointed out that the supplies available to hospitals are sufficient, and intended, to provide for occasional meals and hot [illegible]
that resident st [illegible]
drinks and othe [illegible]

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1. Memorandum on Hospital Diet, 1943. 6*d*.; and see *Lancet*, 1943, ii, 673.
2. *Lancet*, 1945, i, 19, 61, 91, and 123.

Letters to the Editor

OUR TUBERCULOSIS SERVICE

SIR,—The comments of " Observer " in your issue of March 3 suggest that the Joint Tuberculosis Council were remiss in omitting from their report any reference to such related aspects of tuberculosis work as social welfare, medical education, mass radiography, and industrial medicine.

In para 2 of the report, the Council specifically pointed out that a detailed plan was not practicable, and accordingly the report dealt with fundamentals instead of attempting a complete blue-print. The report emphasises, in particular, the fact that a satisfactory service can only be built up in areas which are sufficiently large to undertake comprehensive schemes and to employ first-class clinicians and other personnel. Given these foundations, one could look forward to an efficient service if certain other requirements were met. These would include proper coordination with local sanitary authorities, with local health services generally, with voluntary hospitals and, within the service itself, with sanatoria and dispensaries. On such a basis, but not otherwise, the superstructure envisaged by " Observer " could be erected.

The Joint Tuberculosis Council, however, are for the present much more concerned with principles than with refinements. Social welfare workers, almoners, and mass radiography are all relative fledglings in the tuberculosis world, and it is a little early for the Council to offer guidance on these matters. Medical education and industrial rehabilitation are mentioned in the Council's report, but here again, the emphasis is on principle rather than detail.

For my own part, I believe that if the recommendations in the report could be implemented, the Council would gladly turn its attention to the subjects mentioned by " Observer." But it seems to me that while the foundations of tuberculosis work are still insecure, to fix attention on particular aspects would tend to obscure the main problem.

Oxford. N. J. ENGLAND.

SIR,—Dr. Fuller's letter (March 10) raises one of the major issues involved in the reorganisation of the tuberculosis service. The present position as regards the diagnosis of chest disease in general is that an increasing number of patients are being referred to tuberculosis dispensaries. The reasons are quite clear. Improvements in diagnostic facilities in these clinics—above all the provision of X rays—have established in some areas a unit which is convenient of access both for patient and general practitioner. Tuberculosis is always in mind in a case presenting pulmonary symptoms requiring special investigation ; hence the increasing use of local clinics where they have been set up on an efficient basis. The result is that the tuberculosis officer, in an increasing degree, is having to deal with clinical material which falls naturally within the wider specialty of chest medicine, and is severely handicapped in his work because of the persisting separation of the tuberculosis service from medicine as a whole.

As a solution to the problem, Dr. Fuller suggests that diseases of the chest, including tuberculosis, be dealt with in special hospital departments under the direction of a clinical specialist. The tuberculosis officer—one of the assistant staff—would undertake some part of the out-patient work. The advantages of incorporating the tuberculosis service in the new hospital scheme have been widely agreed, and have been stressed in more than one recent report on the subject ; but it is questionable whether the method suggested by Dr. Fuller would best meet the position.

If a truly efficient service is to be provided, it is of the first importance that all aspects of the problem be dealt with in practice by an organisation within which a proper coördination can be achieved. The clinical part of the work, the social problems, rehabilitation, and prevention, are inextricably bound together, and should be regarded as the responsibility of a single department under an experienced physician. Hospital beds for diagnosis and [illegible] aspects of treatment are required, and assistant [illegible]ical, nursing, and almoner staff must be adequate. Coöperation with sanatoria serving the area, and with other hospital departments, both medical and surgical, is essential. To place the tuberculosis unit as a whole under the control of the medical director of a special chest department, whose interests would be primarily clinical, would not, however, guarantee that wide experience and understanding of the whole subject so essential in medical staff dealing with it. There will also be certain practical difficulties ; special pulmonary units will probably be able to serve an area which has to be subdivided for tuberculosis work, and one physician would scarcely be able to supervise the whole territory.

The deficiencies of the present scheme are to be found in the lack of facilities of all kinds and poor staffing in some areas. To attempt to improve the position by recreating the tuberculosis clinic as a subsection of a department of chest medicine might, however, easily result in the special features of the tuberculosis problem being lost sight of. Also, the limited responsibility and scope of work of the tuberculosis officer would not encourage that improvement in staffing which is desired. It seems preferable to aim at the highest efficiency in a tuberculosis service which is an entity in itself, though it would certainly gain much by being incorporated in the new hospital service. It would there be in touch with general medicine, and yet retain its responsibility for dealing with all aspects of the disease, both as it affects the individual and as it constitutes a major problem of the public health.

HUGH RAMSAY.
A. STEPHEN HALL.

Redhill Chest Clinic,
Edgware.

A FACULTY OF OPHTHALMOLOGISTS

SIR,—In his reply on Feb. 17 to my letter of Feb. 10, Mr. McMullen accuses me of many inaccuracies, and is obviously concerned to indicate, to those unfamiliar with these matters, that the Council of British Ophthalmologists has been representative of a large number of ophthalmic surgeons, and has even taken an active part in ophthalmo-political affairs.

The meeting to which ophthalmologists are invited each year to " receive and discuss " the annual report of the CBO takes place after the clinical meeting of the Ophthalmological Society of the United Kingdom, and those who attend have no voting powers. I have rarely known it to attract much more than a score of interested eye men, most of whom have seemed to belong to the some 25–30 actual members of the CBO. The meeting lasts about half an hour, most of which is occupied by the reports of the secretary and treasurer. The fact that a meeting does take place each year, however, is indeed fortunate, as without it one must assume that Mr. McMullen would have been unable to refute in so devastating a fashion my charge that the CBO has had a purely nominal existence among the mass of ophthalmologists.

Mr. McMullen has found it necessary to go back nearly twenty years to find the few occasions which he cites against my assertion that the CBO has taken no active part in ophthalmo-political matters for well over a generation. Significantly, these isolated excursions into the field they now seem to wish to dominate are undated, so I cannot return the charge of inaccuracy. I can, however, give 1927 as the date on which the CBO officially disclaimed all interest in ophthalmo-political matters by its president's statement at the annual general meeting that " his council was not interested in the problem of fees paid to ophthalmologists "—an attitude it has maintained ever since.

Mr. McMullen has offered no facts opposing the general tenor of my letter, which was an indictment of the Faculty based on the following points :

(a) That the use of the academic title of " faculty " for a body designed to subserve an essentially ophthalmo-political function is unwarranted, particularly under the controversial circumstances of its formation and constitution, and in the absence of fellows.

(b) That it is not democratically constituted.

(c) That it is an attempt to designate categories of ophthalmologists in an arbitrary fashion which is not based upon the interests of ophthalmologists as a group or the public they serve.

(d) That no body of ophthalmologists could accept the proposal of the CBO minute 5, 1944, and now one presumes embodied in the constitution of the Faculty—viz: "that decisions or recommendations of any mass meeting of members or associates should be considered by the Council but should not necessarily be acted upon or implemented." (This detail has been omitted from the *published* announcements.)

Mr. McMullen's concluding paragraph completely confirms the substance of my charge that the Faculty is a manoeuvre to enable a small, unrepresentative body
e the future course of
isfactory to itself, but
Association of British
ge organised group of
represents half the
ophthalmic profession.

London, W1. LIONEL M. GREEN.

A CHAIR OF PSYCHIATRY

SIR,—The proposal to establish a university chair of psychiatry in London University, mentioned in your issue of Feb. 17, raises once again the question of the
n the making of medical
r. Many medical officers
believe that appointments
didates on the spot; and
hostilities cease, or on the
cessation of hostilities in Europe. In this they may or may not be correct. No authoritative statement has been made on the matter. Under the circumstances they are bound to regard their professional future with considerable anxiety. They feel that their chances of

and the delay in getting it, and especially by the knowledge that some appointments may be filled for which time does not permit their candidature.

This matter, and others arising from it, have been discussed at some length by the Consultants in India Command, and they advocate (*a*) that all appointments to the staff of a hospital, university, public institution, or other body, should be temporary until the close of hostilities or until demobilisation is well advanced, and (*b*) that medical officers, serving overseas, should be given ample opportunity to apply for appointments. The difficulties in the rigid application of these proposals, in every instance, are understood and appreciated. Medical reconstruction and other programmes may require that certain appointments be made permanent in order to avoid a break in direction. But such conditions are rare.

The letters of Service Psychiatrist and of Brigadier James are timely; and I desire to associate myself with the opinions contained in them.

E. A. BENNET,
Consulting Psychiatrist, India Command.

SIR,—The impending appointment to the University of London chair of psychiatry is a matter of remote practical consequence to the majority of doctors serving overseas. Why make such a song and dance about nothing? Most of these men are destined to return to civil life as general practitioners, in whose sphere public appointments as a general rule find no place. It is these fellows with no secure jobs to return to, who are most in need of a square deal when the war ends.

Northampton. R. W. MAXWELL.

RESTAURANT HYGIENE

SIR,—I (March 10) that
bacteriolo used to confirm
clinical fi ter was to show
that organisms known to be pathogenic may exist in cracks and chips of crockery. I do not agree that a small number of organisms would necessarily be less dangerous than a large number. A reduction of the number would merely lengthen the period of incubation. Personally I should be just as reluctant to imbibe 2 typhoid bacilli as I should be to imbibe 2000. It may perhaps be true that a small infection of staphylococci is less dangerous than a large infection, but this depends on the individual's condition of health and resistance. My argument is merely that a crack in a cup can hold a
used by an infective
may be transferred
ds, avoid cups with
storage depots of germs; you will be given no guarantee that such a cup has not previously been used by a diphtheria or typhoid carrier.

There is no evidence that disease is spread by this means, because the authorities have not taken the trouble to investigate. I hope Lord Amulree has done so.

London, W1. SYDNEY LINFOOT.

INFECTIOUS DISEASES IN FRANCE

SIR,—Your special correspondent in his article on France Today (March 3) says he was informed that there had been no increase in
children during the war years.
to the figures of admission t
for I hardly think the stateme
as a whole. For example th
Record, issued by the League of Nations secretariat (RH 970, September, 1944) gives the following figures as for cases of diphtheria notified in France:

1928–38 (av.)	10,839	1940	13,568	1942	31,466
1939	11,019	1941	20,018	1943	46,539

In terms of rates per 100,000, the figures "jumped from 35 9 in 1939 to 118 7 in 1943" (*Lancet*, 1944, ii, 628).

Camberley. M. BEDDOW BAYLY.

*** Our Special Correspondent writes: I should have made it clear that Professor Debré was speaking only of the Paris region, and of 1944 as compared with previous years. Thus the League statistics neither refute nor confirm his opinion. I may add that all
German occupation
, whoever may have
[illegible] them. ED. L.

REABLE OR REHABILITATE?

SIR,—For some year or two I have suggested to friends who write and teach that we should say "reable" instead of "rehabilitate." It therefore gives me pleasure, though I stake no claim, to read of "reabling" and "reablement" in your last three issues.

The word "able" was formerly used as a verb, meaning to make strong or to enable (Shorter OED) or to make able (Webster). The OED quotes "I'll able 'em" (*King Lear*) and "If God shall me able" (Evelyn). It is still so used, with the negative prefix, in the verb "disable," and in "disabling, disabled, disablement."

"Rehabilitation" is a dictionary word of respectable age, but it maintains the reputation we doctors have of using long words, and in its relation to medicine might with dignity retire. Your powerful example will favour the simpler terms reable, reabling, reabled, reablement.

Ruthin, North Wales. EDMUND SPRIGGS.

ARTIFICIAL RESPIRATION

SIR,—Artificial respiration by rib traction (Schüller's method) has been known and practised for a long time. This method is described in Chalmers Watson's *Encyclopædia Medica*, vol. I, published in 1899. It is particularly recommended for use in cases of narcotic poisoning as being less fatiguing for the operator where artificial respiration may have to be kept up for a lengthy period.

Heavitree, Exeter. MALCOLM HAY.

THE COMPLETE LEAD-SWINGER

SIR,—Your peripatetic correspondent of March 10 may be interested to learn that the German propaganda leaflet he describes is a copy in many respects of one surreptitiously introduced among German troops, disguised as a miniature treatise on ballistics, an account of which is given by Monsieur Vulliet, under the heading of "Le manuel du parfait simulateur militaire," in *Revue Médicale de la Suisse Romande*, 1911, 64, 55.

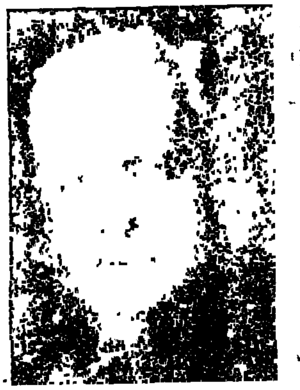
The Library, Royal Society
of Medicine. J. D. KEIDSON.

Obituary

HAROLD CHAPPLE

M CHIR CAMB., F R C S

Mr. Harold Chapple, senior obstetric surgeon to Guy's Hospital, died on March 8 at the age of 63. Though he was due to retire at the age of 60, and had had a coronary thrombosis in 1938, he chose to keep on with his work at Guy's to help the short-handed medical school. His regular visits to the country branches of the hospital must have been an extra strain on his health.



Associated News

He was an Australian by birth, the son of Frederic Chapple, CMG, headmaster of Prince Alfred College, Adelaide, and was educated there and at Adelaide University, where he took his BSc, before going to Cambridge. He got a half-blue for tennis at Cambridge, and showed himself a keen rugby footballer and swimmer, and an able actor. He went to Guy's in 1905, and qualified MB in 1908. After the usual house-appointments, he took his FRCS in 1910 and his M Chir in 1911, and then for a short time was assistant in the obstetric department of the Charité Krankenhaus, Berlin, returning as obstetric registrar to Guy's. He was an enthusiastic disciple of Sir Arbuthnot Lane, whose daughter, Irene, he married in 1911, and published several articles about that time on intestinal stasis and the effects of short-circuiting or excising the colon. When James Targett died, in 1913, Chapple succeeded him as obstetric surgeon at Guy's. He served as a captain in the RAMC throughout the war.

Chapple was an essentially practical gynæcologist, keenly alive to the problems of disease considered as a personal misfortune. He took pains to familiarise himself with details of the patient's home and marital conditions, and gave due weight to emotional as well as environmental factors in planning treatment. He would never allow the search for knowledge to intrude so far into clinical work as to become a menace to the individual patient. To him the supreme test of any form of treatment was the benefit it was likely to bestow on the particular patient in her particular circumstances; if it helped her it was good; if it failed to help her it found no place in his practice. His students thus learnt not only the principles of the specialty he taught but something more fundamental which influenced their whole outlook in later life. He was quick to sum up the character of patient or assistant but could withstand verbosity or ineptitude with unruffled patience. Even though he appreciated to the full how much was at stake for the patient during an operation his habitual calm in the theatre never failed him. He was an excellent host, cheerful and friendly, with a fund of good stories, and he made an admirable president of the Medical Golfing Society during the last five years of his life. Every Guy's man who qualified during the 30 years he was on the staff will remember his sound common-sense teaching in the lecture-theatre, outpatients, or wards.

He leaves a widow and two sons.

THE LATE LORD DAWSON

"S. R. A." writes: Over forty years ago I was attending Dawson's therapeutics class at the London Hospital; and I remember the same choice of the appropriate word, the same force and clearness in his sayings, as were evident later in more responsible and public utterances. As a young man he already showed his charm of manner and his primary thought for the patient's good.

We, later his clinical clerks, recall his demonstrations of how eyes, ears, and fingers must be instruments in investigation; we ought never to have failed to benefit from a single ward round. Later, as his house-physician, it fell to my lot to collect cases for demonstration one a week. Whether he was talking about one case or a series, his enthusiasm was unbounded, and the large crowd of listeners were well rewarded for their regular attendance. A second day in the week he would take only his clerks round the ward, and by his example prove the value of careful examination and kindly treatment. His hospital patients were treated exactly like his private patients, with human understanding. Apart from routine visits he was always willing to come for a bad case. I remember one desperately ill probationer whom he saw daily for some twelve days, even if it meant coming at six in the morning to fit in with other duties. His never-failing courtesy, consideration and kindness to his senior, to his juniors, to sisters and nursing staff, to patients and porters, were a lesson and example to all his team, without any diminution of our admiration for his unique professional ability. He was before his time in his keenness for physical education, and for the development of social medicine, but he also did more than his share in the way of training students in professional knowledge and for the problems of the future.

Before the 1914 war I became a hospital colleague at the London, and I would pay tribute to his chairmanship of the medical staff. He was kept in the chair for many more years than was any other holder. His enthusiasm for meetings and his personal labours in preparation were immense. Early on came all those discussions on medical education for the sittings of a Royal Commission, and his guidance and powers of appropriate phraseology were unique assets in producing the final report. These efforts took it out of him, but a good long summer holiday in the North restored him by October at first; though as the years went by, and powers of recuperation become a bit slower, the return from the summer holiday had to be fixed later. He served the hospital well and faithfully, so that it shared in his reputation and the honours conferred upon him. When his time came to an end, it was the unanimous wish of the medical staff and the lay committee that he should not be allowed to descend to the well-earned rest of the consulting staff, and he remained for another five or six years as extra physician. It was a unique testimonial to a colleague.

A severe test for any medical man is to be laid personally on a bed of sickness. Dawson was not keen on pure athletics as a student, but he was keen on physical education, and he was unusually muscular and fit physically. All the same he had his bouts of confinement to bed, and he made an ideal patient with no questionings and no impatience. He passed this test with flying colours.

As a student of over forty years ago, one can recall how his handsome appearance and bearing appealed to the imagination. In addition his wedding appealed to the romantic element in our nature; and Lady Dawson became a great friend to students and to all the hospital activities. One knows how these two English people helped at times those who had fallen by the wayside. We lose a hero, a very wise physician, a friend, and a counsellor.

LORD MORAN'S TRIBUTE

The following personal appreciation by the president of the Royal College of Physicians appeared in the *Sunday Times* of March 11 and is reproduced by courtesy of the Editor:

It will be a long time before any member of the medical profession will again influence opinion in England as Lord Dawson did between the two wars.

I am not sure that I can explain this to those who did not know him. He stood apart from others not so much for his pre-eminence as a physician, but rather because he possessed a gift which is more prized than any other by men of affairs: he knew instinctively what the average man was thinking and how he would react to some measure or action that had been taken by the official world. He was, of course, born with that gift, but he had developed and perfected it over the years until his judgment in such matters was impressive.

This almost intuitive knowledge of what was happening in men's minds contributed to his success in practice—and no doctor in his time was more successful. Once when I had seen a patient with him and we had to explain to half a dozen relatives the gravity of the complaint, he appeared to divine at once what was passing through their minds, and he was able to quieten their fears in turn before they had even found expression.

Like his Royal patient, King Edward VII, Lord Dawson was more interested in men than in books. He learned from experience, so that he had come to have a profound knowledge of the ways of men. His name was a household word for two generations; all the prizes that the world can give were his. Great professional success makes day of night, but he never hurried over anything, and he gave as much care to the humblest commoner as to the King of England.

He was quite unspoiled by success, and never lost his curiosity in young people. He spoke to them as one of themselves, and they opened their hearts to him. Lord Dawson himself seemed until quite lately to be untouched by time. His eager spirit continued to regard life as great fun; it was still an adventure that had not lost its freshness. In mind and body he remained alert; even

wo steps at a time.

He wrote to me after

good, but not very far."

re serious operation he

remained undefeated. He insisted on being kept in touch with affairs, and one of those summoned to his bedside has told me that it was an hour and a half before he was allowed to depart. He had enjoyed a strenuous life, and now he was resolved to go on working to the end.

MEMORIAL SERVICE

A great body of Lord Dawson's friends and colleagues, and representatives of the many institutions with which

rvice in West-

The Dean of

On Active Service

CASUALTIES

DIED

Captain Bernard Alfred Maclean Brown, MC, BM, RAMC

WOUNDED

Captain W. J. Cameron, RAMC
Captain A. L. Stalker, MB ABERD., RAMC

AWARDS

MBE

Captain J. H. D. Millar, MD EDIN., RAMC

Flight-Lieutenant R. C. Dickson, MB EDIN, RAFVR

ground personnel during difficult periods.

MEMOIR

Flight Lieutenant E. A. Wallis was born in 1912, and studied medicine at the Royal Colleges, Edinburgh, qualifying in 1940. After a hospital appointment at the Eastern General Hospital, Edinburgh, he was commissioned as flying-officer in the medical branch of the RAF Volunteer Reserve in 1941. At the time of his death he was serving as medical officer to a squadron overseas.

Colonel

physician

who has

honorary surgeon in place of Major-General R. H. Candy, IMS, who has retired.

Notes and News

STAINING OF TISSUES

In 1714 Leeuwenhoek, in a letter to the Royal Society, described the staining of cow muscle with saffron macerated in wine. He hoped to distinguish the muscles of a fat and a lean cow; instead, he discovered the value of colouring agents in microbiology. Reichel (1758) and an Englishman John Hill (1770) added a little to early knowledge, but it was not until 1848, when Quekett mentioned the use of fustic and logwood in making tissues less transparent, that interest in non-vital dyeing revived. Two botanists, Goeppert and Cohn, described the value of carmine in 1849, and two years later Corti made the fundamental observation that the nuclei of the epithelial lining of the cochlea could also be stained with carmine. Dyeing as a standard technique in animal histology was introduced by Gerlach in 1858.

The injection of coloured substances into blood-vessels was a much earlier discovery. Eustachi (1524–74), Malpighi (1628–94), and others used the method to help naked-eye observations; but Ruysch (1725) employed the microscope to examine specimens which he injected with tallow and wax coloured with cinnabar. Vital colouring of pre-existent structures was discovered by Trembley (1744), who made members of the genus hydra flame-coloured by feeding them with the integument of hydrachnids, or a delicate green by a helping of rose aphids from which the legs had been removed to make them easier to swallow. Von Gleichen (1778) produced colouring by phagocytosis when he fed infusoria with carmine-coloured water mixed with an infusion of wheat. The application of this method to the cells of metazoa was first made by Ranvier (1875) who injected suspensions of aniline-blue and vermilion into the dorsal lymph-sac of frogs and subsequently found the coloured particles within the cytoplasm of lymphocytes.

The value of chemical composition was demc the discovery of the blue reactic ngs to Colin and de Claubry in 1814. But the real founder of histochemistry was François Vincent Raspail who described in 1825 the results of the application of chemical processes to specimens examined under the microscope. Among his achievements are the discovery of the xanthoproteic reaction, Liebermann's test, and the aldehyde test for proteins, and the invention of the frozen-section technique, and micro-incineration. Trying to publish some of this remarkable work, Raspail sought the advice of a physiologist, a chemist, and a botanist. Unfortunately the first was ignorant of chemical reactions, the second of microscopy, and the third of both; but the book was published in 1830. Baker's[1] logical and lively essay on these important scientific events should interest all biologists as well as historians.

Royal College of Surgeons of England

The King, who is Visitor of the College, has made a donation to its restoration and development fund.

At a meeting of the council held on March 8, with Sir Alfred Webb-Johnson, the president, in the chair, it was decided to extend admissibility to the fellowship examinations to holders of any medical qualification registrable on the British Medical Register.

Sir Arthur MacNalty was appointed Thomas Vicary lecturer for 1945; Prof. W. E. Gye, FRS, and Dr. L. Foulds were appointed Imperial Cancer Research Fund lecturers in the College for 1945.

Diplomas of membership were granted to J. A. Litchfield and R. E. Moore. The following diplomas were granted jointly with the Royal College of Physicians:

DOMS—P. L. Allen, Jacob Berkson, E. A. Butterworth, J. S. Crawford, G. P. Crookes, Abraham Dala, W. M.-C. Gilmour, A. D. Lamb, R. L. Parish, J. M. P. Smith.

Coffey, J. C. Dore, E. W. Hyde, hon. Berthold Mannheimer, S. L. illivan, T. R. Riley, Karol Flehcr,

Auxiliary Royal Army Medical Corps Funds

The annual general meeting of the funds will be held at 11, Chandos Street, London, W1, on Monday, April 9, at 6 P.M.

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[1] The Discovery of the Uses of Colouring Agents in Biological Micro-technique (Monograph of the Quekett Microscopical Club.) J. R. Baker, DSC. London: Williams and Norgate. Pp. 22. 1s. 6d.

Queen Mary's Hospital, Roehampton

The Ministry of Pensions has arranged for a free bus service for disabled patients and their escorts between the hospital and Barnes station-bridge.

Royal Eye Hospital

At a meeting of the clinical society to be held at the hospital St. George's Circus, Southwark, SE1, on Friday, April 27, at 5 PM, Mr. T. E. Cawthorne will speak on nystagmus.

Royal Society of Medicine

The house and library of the society will be closed from Good Friday, March 30, to Easter Monday, April 2.

At the section of odontology on Monday, March 26, at 4.30 PM, Captain Sognnaes will speak on four months in Tristan da Cunha, and Prof. Sheldon Friel on migrations of teeth following extractions.

Association of Industrial Medical Officers

The Scottish group of the association will meet on Wednesday, March 28, at 2.30 PM, in the orthopædic department of the Western Infirmary, Glasgow. Prof. C. W. Illingworth will speak on the peptic ulcer, with special reference to factory conditions, and Mr. Roland Barnes on treatment of the painful shoulder, and the problem of resettling in industry.

Middlesex County Medical Society

At 5.30 PM, on Tuesday, March 27, at West Middlesex County Hospital, Isleworth, Sir Joseph Barcroft, FRS, will read a paper on movements of the human fœtus, which will be illustrated by a film produced by Dr. M. M. Deane, Miss Irene Titcomb, BM, and members of the obstetric staff. At 6.15 PM, Mr. Frank Law will speak on ophthalmoscopy in general medicine.

Register of Physiotherapists

The Chartered Society of Physiotherapy (formerly called the Chartered Society of Massage and Medical Gymnastics) has resigned its membership of the Board of Registration of Medical Auxiliaries as from Jan. 1, 1945, and the society's own directory will now be the only complete record available concerning chartered physiotherapists.

Refresher Courses for American Medical Officers

Medical officers of the United States Army who for a year or more have been engaged in administrative and other non-professional work and who are to be assigned to professional duties will be given an opportunity of taking refresher training at general and regional hospitals for a period of not more than 12 weeks.

Consultant Appointments for LCC Officers

Dr. A. J. Lewis, clinical director at Mill Hill Hospital, has been appointed civilian consultant in psychiatry to the Royal Air Force. Dr. Eliot Slater, clinical director at Sutton Emergency Hospital, is to succeed Dr. Lewis as consultant in medical psychology at the British Post-Graduate Medical School.

Paddington Medical Society

On Tuesday, March 27, at 9 PM, in the board room of St. Mary's Hospital, London, W2, Mr. F. A. Juler will deliver a lecture on modern remedial measures in ophthalmology.

Board of Control

Dr. W. S. Maclay, superintendent of Mill Hill Emergency Hospital, has been appointed a senior medical commissioner of the Board.

Dr. Maclay, who is a son of the first Baron Maclay, received his medical education at Cambridge and St. Bartholomew's Hospital, qualifying in 1927. He spent 3 years as medical officer in native hospitals in Kenya, and after holding appointments at the Royal Chest Hospital, and Great Ormond Street, he returned to Bart's
as chief assistant in the department of [illegible]
obtained his MD Camb. in 1934 and t [illegible]
year. He is physician to outpatients [illegible]
and is also on the staff of the West Lo [illegible]
George Hospital, Ilford. Since the war he has been in charge of the EMS neurosis centre at Mill Hill, and in 1943 at the request of the Ministry of Health he visited the United States and Canada, lecturing and showing a film of the pioneer work done at the hospital. He was appointed OBE in 1943. Dr. Maclay's published work includes papers on the effects of mescalin and on schizophrenic drawings.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken indication that they are necessarily available for export.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED MARCH 10

Notifications.—The following cases of infectious diseas were notified during the week: smallpox, 0; scarle fever, 1424; whooping-cough, 1502; diphtheria, 472 paratyphoid, 5; typhoid, 5; measles (excludin rubella), 25,049; pneumonia (primary or influenzal) 813; puerperal pyrexia, 144; cerebrospinal fever, 77 poliomyelitis, 7; polio-encephalitis, 0; encephaliti lethargica, 5; dysentery, 412; ophthalmia neonatorum 47. No case of cholera, plague, or typhus fever wa notified during the week.

The number of service and civilian sick in the Infectious Hospita of the London County Council on March 7 was 1225. During th previous week the following cases were admitted: scarlet feve 23; diphtheria, 17; measles, 165; whooping-cough, 26.

Deaths.—In 126 great towns there were no deaths fro scarlet fever, 1 (0) from an enteric fever, 24 (0) fro measles, 3 (1) from whooping-cough, 6 (0) from diph theria, 52 (6) from diarrhœa and enteritis under tw years; and 39 (5) from influenza. The figures in pare theses are those for London itself.

Leeds reported 4 deaths from measles. There were 10 fat cases of diarrhœa at Birmingham.

The number of stillbirths notified during the week wa 171 (corresponding to a rate of 25 per thousand tot births). including 20 in London.

Births, Marriages, and Deaths

BIRTHS

BROUGH.—On March 7, the wife of Dr. Maurice Brough, of Rushde Northamptonshire—a son.

CORCORAN.—On March 12, at Bognor Regis, the wife of Major T. Corcoran, RAMC—a son.

GARAI.—On March 14, in London, the wife of Dr. Oliver Garai— son.

HOLMES.—On March 13, at Grantham, the wife of Dr. J. C. Holmes—a son.

WEDDERSPOON.—On March 11, at Newcastle-on-Tyne, the wi of Surgeon Lieutenant J. M. Wedderspoon, RNVR—a daught

MARRIAGES

BRUCE—HERDMAN.—On March 11, in Edinburgh, J. Alastair Bru FRCPE, lieut.-colonel RAMC, to Nan Herdman, junior co mander, ATS.

ELLIOTT-BLAKE—SWAYTHLING.—On March 17, in London, Hen Elliott-Blake, FRCS, to Lady Swaythling.

FELTON—HERVEY.—On March 17, at Great Billington, Be William Fowler Felton, major RAMC, to Felicity Anne Hamilt Hervey.

KINGDON—BRETT.—On March 14, at Sedlescombe, Ernest Co Kingdon, MB, to Lilian May Brett.

LUCY—BLOXHAM.—On March 12, in London, Henry William Luc OBE, lieut.-colonel RA, to Betty Cecil Bloxham, MB.

RUBIN—GILROY.—On March 14, at Tiverton, Jack Rubin, FRCS to Margaret Joanne Gilroy.

TAYLOR—MADEW.—On March 10, at Worthing, Harry C. Taylor, MD, to Margery Madew.

DEATHS

BELT.—On March 7, Thomas Henry Belt, MD TORONTO, aged 43

BETTS.—On March 9, at Crowborough, William Andrew Bett CMG, MD EDIN. & CAPE TOWN, FRCSE, aged 78.

EDWARDS.—On March 10, at Devoran, Philip Hugh Edward MRCS, aged 75.

EYRES.—On March 12, at Swale, Keswick, Hugh Middleton Eyre MB EDIN., formerly of Richmond, Yorks.

LEWIS.—On March 17, at Rickmansworth, Sir Thomas Lew CBE, MD. LOND., LLD BIRM & WALES, FRCP, FRS, aged 63.

MUMMERY.—On March 13, Stanley Parkes Mummery, MRCS, LD of Harley Street, London, W1.

SEYMOUR.—On March 11, at Rottingdean, Sussex, Harold Farl Seymour, MD LOND., FRCS, FRCOG, formerly of Hove.

ROSE-HIP SYRUP FOR POLISH CHILDREN IN FRANCE.—Local wine merchants in the Verdun area have lately bee bottling 1000 gallons of rose-hip syrup, flown from th country in casks, for distribution among a large number Polish children suffering from malnutrition. These childre had been deported to France by the Nazis to help with t root crops, and our advancing armies found them in a conce tration camp badly underfed and showing serious signs vitamin deficiency. In response to an appeal, the Ministry Supply found that 1000 gallons of rose-hip syrup, rich vitamin C, could be spared from the stocks now on sale chemists' shops for children and adults. The hips had bee gathered by voluntary collectors—mostly schoolchildre Boy Scouts, and Girl Guides. The whole amount has no been bottled and distributed.

RESETTLEMENT OF THE DISABLED IN WORK

THOMAS FERGUSON.
M D, D SC EDIN., F R C P E, D P H, F R S E
PROFESSOR OF PUBLIC HEALTH IN THE UNIVERSITY OF GLASGOW

IN different countries the approach to settlement and resettlement of the disabled in suitable work has followed different lines.

In Denmark, for instance, where since 1927 the Invalidity Insurance Court has administered a statutory scheme designed to prevent or mitigate "invalidity" (reduction to one-third or less of normal earning capacity by virtue of disability), the approach has been predominantly medical. There is a system of compulsory notification to the State by doctors and the heads of hospitals and schools of all "invalids" or potential "invalids," and they are given thorough medical or surgical care: some 0·5% of the cases notified receive vocational training and a further 2% are helped to obtain machines for work at home.

In the United States, on the other hand, where it has been estimated by the public health service that as many [illegible]

[illegible] along the lines of vocational placement with extensive "job analyses" designed to ascertain what jobs are [illegible]

[illegible] to men and women disabled from whatever cause—whether invalided out of the Services, rejected for military service, or referred by civilian doctors or hospitals. It was designed to find for the disabled work [illegible]
com [illegible]
repr [illegible]
the [illegible]
has [illegible]
con [illegible]
ment, with a statutory obligation on industry to employ a quota of disabled persons.

EMPLOYMENT AFTER INVALIDING

In 1942 a study was made of the health and working [illegible] persons of Scottish domi- [illegible] unfit for further service.[1] [illegible] in the framework of the interim scheme of the Ministry of Labour and National Service; where necessary the records were amplified by consultation with hospitals and with family doctors. Efforts were made to secure suitable work for the men and in some cases hospital treatment was arranged. All were followed up during the third month after discharge, and when necessary they were helped. They were followed up again six months after leaving the Services, and data were collected about their medical, social, and employment experience since their return to [illegible]

[illegible] order, psychoneurosis, peptic ulcer, and injuries. Duration of service with the Forces ranged from a few weeks upwards, and was less than 3 years in some five-sixths of the cases.

During the six months following discharge, 65% received care from their own doctors and 16% hospital treatment for the condition for which they were discharged from the Services. At the end of that period 16 5% were unemployed, 40% had [illegible]
work, 30% had taken up new work [illegible]
4·5% new work with training under [illegible]

26% returned to the service of their old employer, some to do lighter work. Altogether, 26% of the men made false starts at work at which they were unable to continue. Of those who were known to return to work, the majority did so within a month, and over 90% within three months of leaving the Forces. At the end of six months, 37% of the men reported difficulties of varying kinds, and it was found necessary in 19% of cases to take exception to the nature of the work done by the men in view of their disabilities, or in some cases their failure to obtain medical treatment urgently required.

While these results leave much to be desired, they are [illegible]

A SAMPLE OF CHRONIC INCAPACITY

[illegible] continued incapacity for [illegible] population are known. [illegible] ing June 30, 1938, the total volume of sickness incapacity was 14·08 days per insured person, and incapacity which continued throughout the whole of the statistical year represented 43·8% [illegible]

[illegible] the circulation, [illegible]
neurasthenia a [illegible]
system, and tu [illegible]
long past any prospect of restoration to fitness for work, but an investigation before the war under the auspices of the Department of Health for Scotland indicated that there was considerable prospect of arresting the drift into chronic incapacity, though this would sometimes require change of employment.

APPLICANTS FOR TRAINING IN NEW WORK

To obtain further information about the type of patient with residual disability presenting employment problems at the present time—when the circumstances of war are likely to upset the clinical distribution of disability, the availability of work, and the nature of that work—and an estimate of the difficulties of disabled men, it was decided to follow up the experience of a series of men who had applied in 1942–43 for training under the interim scheme. The cases applying for training represent a mere fraction of the cases in which guidance on work (and often change of work) is necessary because of residual disability; they probably include more than a fair share presenting special employment difficulty as well as a leaven of men who, being ambitious, are anxious to have training to open new doors.

In this series it was found that 40% of the applicants for training had been disabled in the present war, and 10% in the last [illegible]
in the remaind [illegible]
illness arising i [illegible]
Some of the men have been idle, or at work only intermittently [illegible]

[illegible] whether the training [illegible]
in others it was uncer [illegible]
condition was equal to the work on which he had set his heart.

[illegible] training are interviewed by
pa [illegible] ntatives of the Ministry of
La [illegible] ce as well as technical men
actually engaged in the training of disabled in centres, and a doctor experienced in industrial work: clinically [illegible]

[illegible] medical officer at the training centre in his supervision [illegible] training. Training may be refused because [illegible] is no prospect (in the absence of sheltered employment not yet available) of the man becoming employable; or because he is either not yet fit for training or

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1. Health and Industrial Efficiency. HM Stationery Office. 1943.

regarded as permanently unsuited for it; or because he is already doing some work which appears as satisfactory as any for which he could be trained; or because by virtue of some previous industrial experience, he can be placed directly in some suitable work. Some of the men would have benefited from a period at a fitness centre before embarking on vocational training.

Laymen are usually ready enough to recognise the employment limitations of such gross surgical conditions as amputations; but even with the best intention they are much less appreciative of the difficulties arising from such conditions as cardiac disease and epilepsy, which usually present far greater placement problems. A combination of layman plus medical dictionary, however good, is no substitute for skilled medical assessment of the individual case, and may be a menace in dealing with the disabled, as in many other spheres.

The range of subjects in which training courses were available at the time of this survey was somewhat restricted by war needs; of 463 men accepted, 116 were for training in electric welding, 98 in fitting, 80 in machine-operating, 57 in instrument-making, 42 in commercial subjects, 34 in radio fault-finding, and 36 in a variety of other occupations—including sheet-metal work, store-keeping, and boot-repairing. Normally the length of training given varied with the occupation involved and with the severity of the disability. It might range from a 6-weeks course in store-keeping to 26 weeks or longer in commercial subjects or radio fault-finding. About 20% of the men accepted for training did not complete the training course, rather more than half of these having to stop on medical grounds and the others because of lack of aptitude or assiduity. In about half the cases where training was abandoned, it ended during the first month; and in nearly half of the cases in which training was abandoned, the men were unemployed six months afterwards.

Six months after the end of the course 82% of those who began it were in employment, while of untrained men followed up six months after their interview by the selection panel, 75% were in employment.

FACTORS INFLUENCING SUCCESS IN RESETTLEMENT

In the above sample the disabled of this war fared better than any other group: the percentage of them unemployed six months after completion of training, or (when they were not accepted for training) six months after their interview, was 14; whereas the corresponding percentage for the other groups was 24. The disabled of the last war fared worst of all, close on a third of them being found to be unemployed.

Age influenced the success of resettlement. Thus, among the men who were trained 15% of these under 35 were unemployed six months after completing training, as against 24% of these over 35. Of the trained men who were in employment, a higher proportion of the under-35's were working in the occupation in which they had been trained than was the case with older age-groups. Of men not accepted for training, 15% of the under-35's were not working six months after interview, compared with 37% of the over-35's. These figures suggest that, generally speaking, training did more to help to employment the older group of applicants: but this fact has to be taken in conjunction with the circumstances of wartime, and perhaps with a certain tightening of selection apt to operate in the decision to train an older man.

The success of resettlement was also influenced by duration of disability. Where the disabling condition had existed less than 5 years, 16% of the men were found on follow-up to be unemployed, and the figure was substantially the same for trained and untrained. Where the condition was of more than 5 years' duration, the percentage unemployed was 25. The unfavourable experience of the latter group, while apparent in the experience of both trained and untrained men, was particularly noticeable in the case of the untrained.

The success of resettlement varied with the subject in which training was given, but care must be exercised in assessing relative degrees of success, on account of factors operating in the selection of workers for particular jobs as well as the demands of the work concerned, and opportunities for remunerative employment after training. the six training courses chiefly employed in this e best results appeared to be obtained with fitting and electric welding, where the percentages of men unemployed after completing training were respectively 12 and 14 (table I). More of the men trained as welders were found to be working as such than was the case with fitters; training in fitting seems to have enabled a number of men to undertake and hold work not as fitters but in which their fitting experience was of value. At the other end of the scale, men trained in commercial work fared badly: 34% of them were unemployed six months after completing training, a result doubtless influenced in large measure by the fact that for many of these men commercial training seemed to offer the only alternative to unemployment, for which reason they were encouraged to see whether they could make the grade, though sometimes their educational background was such that they would find it difficult.

TABLE I—SUBSEQUENT EMPLOYMENT HISTORY OF MEN WHO COMMENCED TRAINING IN CERTAIN OCCUPATIONS

Occupation	% Working		% Not working
	As trained	Not as trained	
Electric welding ..	64	22	14
Fitting	47	41	12
Instrument-making ..	42	40	18
Radio fault-finding ..	32	44	24
Commercial	45	21	34
Machine-operating ..	51	25	24
Others	56	31	13
All occupations ..	51	31	18

TABLE II—SUBSEQUENT EMPLOYMENT HISTORY OF MEN WHO APPLIED FOR VOCATIONAL TRAINING

Not trained			Disease group	Trained *			
					Working		
Total	Working	Not working		Total	As trained	Not as trained	Not working
10	8	2	Peptic ulcer	35	14	11	7
13	11	2	Cardiac disease	32	12	10	10
6	4	2	Tuberculosis: pulmonary	22	13	5	4
9	6	3	Tuberculosis: non-pulmonary	27	11	9	7
17	15	2	Psychoneurosis	21	8	7	6
19	11	8	Organic nervous disease	39	20	11	8
64	47	17	Injuries	156	86	43	27
44	35	9	Others	131	71	45	15
182	137	45	.. Total ..	463	235	144	84

* Includes all men who embarked on training.

Efforts to help disabled men can succeed only along the lines of individual approach and appraisal; any attempt to mass-produce courses of action for groups of disabilities must fail. It is true that the results returned by different clinical groups vary broadly, as set out in table II, but even within groups there is enormous variation.

ADVICE ON CHOICE OF EMPLOYMENT

The basic questions to be considered in advising a disabled man have been well summarised in a manual issued under the authority of the division of industrial hygiene of the United States Public Health Service:

(1) What job can he work at productively (to which might be added "and happily")?
(2) Can he do the job proposed without being a danger to himself or to others?
(3) To what extent, if any, does he require continuing medical supervision?

These considerations imply a much closer association than usually exists between the doctor and the industry of the area in which he works—as general practitioner or as member of a hospital staff. American experience has shown that nearly every disabled person is capable of doing some useful work, unless he is ill in the common meaning of the term; but if all these disabled people are in fact to be resettled usefully into industry there must undoubtedly be a reorientation of the outlook of industry towards the disabled.

In general, return to old employment is the ideal, provided such employment is not likely to aggravate disability; for there is still something of the joy of craftsmanship that invests return to a man's trade with special satisfaction. It occasionally happens that the [illegible] the reporting [illegible] sometimes by [illegible] disabled man may be enabled to do work which would otherwise be beyond him.

If a man is unlikely to b[illegible] able satisfaction work for [illegible] of the individual case, in[illegible] the area in which it is proposed that he should live and work. One man, aged 59, suffering from duodenal ulcer, all his days a miner, came with a suggestion for watch-repairing or radio fault-finding, both involving formidable changes for a man of his age: he was advised to do pit-head work, at which he has since worked quite successfully. The aim should be to make the disabled man thoroughly competent in some particular job rather than an indifferent handyman; and experience proves that many men can be trained to perform useful and exacting work, although they may have severe disabilities.

PARTICULAR DISABILITIES

In advising disabled men on employment one must keep ever in mind the importance of ability rather than disability; but it must also be remembered that some men, in their keenness, seek work beyond their physical compass.

In the sample analysed above, patients suffering from *cardiac disease* who were not accepted for training appeared to hold employment better than those who were accepted. For this there were two probable reasons: (1) where a cardiac patient was already doing any work reasonably well he was encouraged to remain in it, even though he hankered after something more exacting; and (2) experience which men gained during training sometimes led them to take up much heavier work than that in which they were placed.

> For instance, a lad of 27, with rheumatic valvular disease had done no work since leaving school. It had been suggested to him that he should train in fitting. Medical opinion favoured a more sedentary job, and it was decided to train him in instrument-making. He did reasonably well at the training centre but on completion of his course he went to work as a grinder in an Ordnance factory; though he had the necessary technical ability he could not stand up to the physical strain involved. Six months after completing training he was unemployed.

Only experience can strike a fair balance between the desire to do the best for a disabled man and the reasonable use of resources. I[illegible] in work that looks as i[illegible] must be kept with him [illegible] without harm.

Much the same factors operate in the case of men suffering from bronchitis and other *respiratory disease*.

> A patient of 23, boarded out of the Services for chronic bronchitis and asthma, soon found work as a carding operative in a woollen factory. Medical representations were at once made that this work was unsuitable, and inquiry showed that within a fortnight his complaint had been aggravated, and that he was off work. Some months later he was still unemployed.
>
> A man of 20, who before the war was a jute worker, was boarded out of the Army for chronic adhesive pleurisy. He was recorded on discharge as suitable for machine operating (of which he had some experience) but as unfit for work in the jute industry. Nevertheless he returned to jute work, and within two weeks relapsed. He has since done well on a job not involving heavy exposure to dust.

Patients with *peptic ulcer* constitute a big problem, partly because of their number and partly because of the difficulty of securing for them, particularly in war-time, suitable food, work and working conditions. In dealing with these men a first essential is to make sure that the food they [illegible] allow them to undertake the [illegible] The aim should obviously be [illegible] enabling them to have regular and suitable meals, and so far as possible free from nervous tension. Many men are known to have [illegible] is often some time before these men regain anything approaching the health and work equilibrium that was theirs before joining the Forces.

Experience suggests that as a rule ulcer patients do not do well in work involving much stooping or heavy lifting. It is well known that transport drivers are particularly prone to duodenal ulcer, and it is curious that so many men with this disability seem to have set their hearts on motor-driving.

The group of *psychoneurotics* is another in which men trained in new work were less successful, as regards employment, than those who returned as soon as possible to work they had previously done reasonably well. The term psychoneurosis covers a variety of clinical types but all show an instability that is apt to permeate the man's whole life and work. These people often flit uneasily from job to job, and few of them settle well to training in new work. They should be accepted for training only on [illegible] how [illegible] and [illegible] are [illegible] surroundings and almost always work best near their own homes and in a familiar setting. They may be easily tired, and their tiredness sometimes exaggerates their special disabilities; so it is helpful to start them at work on short hours. They cannot undertake responsibility without undue anxiety and often have speech disorder. These men generally do better if they return to their old job, or to a modification of it, rather than try to learn something new.

> One man, aged 38, invalided from the Army for severe post-concussional symptoms regarded as likely to be permanent and severe, was before the war employed as a colliery surface worker. He was confident that he could resume that employment, and though he had been advised to stay off work for some time he resumed surface work within a month of returning home. Not content with that, he soon afterwards became an underground worker, and has continued as such throughout the period of observation, reporting no troubles.

Disorders of vision sometimes present special difficulty. Loss of vision below horizontal level is particularly serious because of the insecurity it often engenders. Interference with field of vision is obviously important in relation to work on machines or where there is risk of injury from moving objects.

Epilepsy is always a serious problem in relation to employment, and epilep[illegible] fraught with a heavy risk [illegible] or to others. But the ris[illegible] epileptic to another, as does the warning of the onset of attack which the sufferer receives. Employment in these cases can be determined only when the frequency and nature of attacks are accurately known and when the patient's condition has been reasonably stabilised. Epileptics notoriously tend to understate their disability.

CONCLUSIONS

Many factors influence resettlement in work. The attitude of employers is important, and especially the attitude of their foremen, who can do much to make or mar success; so too is the attitude of work-mates—who sometimes grow weary of the little extra help that may make all the difference—and the attitude and adaptability of the disabled man himself. In cases of injury the problems raised by compensation are often a hindrance to resettlement.

Light work within the industry in which the man was employed before he was incapacitated may be the most satisfactory means of restoring him to full fitness for work, but safeguards are necessary to prevent abuse of light work in this connexion and to see that he is not allowed to drift along indefinitely in light work when he in fact can do something better. The future of the severely disabled man is so much in the balance that anything that makes him even a little more efficient adds enormously to his prospect of successful resettlement. We must therefore secure the highest possible measure of physical and psychological repair.

Generally speaking, the longer the disability has lasted the less satisfactory the prognosis. Age, too, is important. In Denmark it has seldom been found economically worth while to train in new work a disabled man over the age of 35, and recent experience in this country certainly confirms that in general younger men do best in new employment. The care of the disabled should be set afoot as early as possible.

Geographical considerations may be weighty. Sometimes the district in which the man lives does not offer much scope for new employment, either because of the unrelieved heavy industry in it or because of limited facilities for any employment. Thus in Scotland it is not easy to find suitable work for disabled men in some areas of Lanarkshire or in some of the more remote parts of the Highlands. The previous industrial experience of the disabled man is of great importance : for instance, a man may be unable to follow his trade as a woodworker, but if he can be given a certain amount of commercial training and this can be related to his basic knowledge of the wood-working industry, then he may become a very valuable agent. In the presence of serious disability it is often best for the man to return to an industrial environment with which he is familiar ; if possible, even to the factory in which he was formerly employed.

Disabled men encounter many difficulties, with medical, social and employment aspects closely interwoven. Some find their work too heavy ; some cannot manage long journeys to and from work on top of a long working shift ; some have difficulty in obtaining tools ; some have difficulty in obtaining suitable clothing. Many have financial troubles ; the wages they are able to earn are often too low for their responsibilities. Many chafe at what they think are irksome pension delays. Many have difficulty in getting a suitable house : a disabled man may find it almost as hard to make his way up and down the stairs of a high tenement house as it is to do his day's work. To be successful the approach to the problems of disability must be individual, and the disabled man must be kept in view until he is seen to be settled in work within his compass.

ARE THE SULPHONAMIDES MERELY BACTERISTATIC AGENTS?

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HUNDREDS of times in the last few years it has been stated that the sulphonamides merely inhibit the growth of susceptible organisms—they do not kill. But is it true?

In 1936 Colebrook, Buttle, and O'Meara stated that all streptococci were killed by two samples of serum taken respectively 3 and 5 hours after doses of sulphanilamide, whereas in the patient's serum before treatment the same streptococcus had grown out to many millions. In 1939 Wolff and Julius reported bactericidal effects when sulphanilamide was added to broth in vitro. In 1938 Hoare supplied further evidence. In his experiments he frequently found complete killing of hæmolytic streptococci by normal human serum to which sulphanilamide had been added. Such killing was obtained with four different strains. In his experiments r [illegible] ms were taken (dilution to more than 1 in a million) to avoid carrying over a growth-inhibitory amount of sulphanilamide in the explanted samples of serum, but the results would have been still more conclusive had he explanted into medium containing *para*-aminobenzoic acid. The antagonism between this substance and the sulphonamides was not known, however, when the experiments were done.

In order to obtain that further degree of certainty we have recently carried out such tests. Instead of serum we used a nutrient broth to which lysed horse blood had been added, to render it free from sulphonamide-antagonisers (Harper and Cawston 1945).

1 c.cm. volumes of this broth, with and without added sulphonamide (10 mg. per 100 c.cm.), were implanted with a diluted culture of hæmolytic streptococcus. Viable counts were made by explanting an aliquot part of each tube (100 c.mm.) in melted blood-agar plus *p*-aminobenzoic acid (*a*) immediately, (*b*) after 6 hours' incubation. After a further 18 hours' incubation the remaining 0·8 c.cm. of infected broth was explanted in the same way. The results were as shown in the table.

Strain and type	Drug and concentration in the broth (mg. per 100 c.cm.)	Number of colonies grown from :		
		0·1 c.cm. sample		Whole 0·8 c.cm.
		Before incubation	[illegible]	[illegible]
Hunter *	Sulphanilamide 10	83	302	0
,,	Nil	80	thousands	millions
Pllu *	Sulphanilamide 10	101	69	1
,,	Nil	112	thousands	millions
Tomlinson (B3264)	Sulphanilamide 10	110	550	0
,,	Nil	101	thousands	millions
Lloyd (25)	Sulphanilamide 10	125	89	0
,,	Nil	118	200	millions
Hunter	Sulphapyridine 10	56	152	0
,,	Nil	66	millions	millions
Hunter	Sulphathiazole 10	60	120	0
,,	Nil	64	millions	millions

* Unidentified type

It will be seen that, with the exception of the one experiment in which a single colony grew out from the sulphonamide broth after 24 hours' incubation, there was complete killing of the 4 strains of streptococci ; and that this result was obtained with sulphanilamide, sulphapyridine, and sulphathiazole. All three substances evidently exerted a bactericidal as well as a bacteristatic effect. It was not the purpose of these experiments to determine the limit of bactericidal effect obtainable with this concentration of sulphonamide, but rather to get unequivocal assurance that no cocci remained viable after a few hours—ruling out thereby a mere bacteristatic effect. Other experiments carried out by one of us (L. C.), and those reported by Hoare, indicate that serum containing sulphonamides will often reduce the viable count within 24 hours from several thousand to less than a hundred. Killing of that order by all the body fluids may well play an important part in suppressing an incipient infection by susceptible organisms.

There remains the more academic question : What bearing have these bactericidal effects on the mechanism of sulphonamide action ? Did the streptococci die off within 24 hours simply because their normal metabolic processes were interfered with by the sulphonamides (Woods 1940), or does some other mechanism come into play ? The fact that hæmolytic streptococci are known to survive for weeks or months without added fresh nutriment—e.g., in the dried state—suggests that intereference with their metabolism is not enough to account for their rapid changing in the above experiments to the non-viable state.

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PENICILLIN IN CLOSTRIDIAL INFECTIONS

JUNE 8 TO JULY 24, 1944

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From the Penicillin Unit of an EMS Hospital

THE first 6 weeks after D-day, before medical services could be fully organised in France, provided an opportunity in a transit hospital in England to make some observations on the influence of penicillin on the incidence and course of gas-gangrene and allied conditions. Cases in this hospital and a second series (series 2) observed in the Radcliffe Penicillin Unit of the Medical Research Council, all treated prophylactically with penicillin, provided a third opportunity—that of studying the clinical effects of clostridial infections in the absence of *Staph. aureus* or *Strep. hæmolyticus*.

The purpose of this report[‡] is to demonstrate, first, that the rôle of penicillin should be to prevent the development of gas-gangrene rather than to treat the established condition; secondly, that inadequate "prophylactic" administration may lead to a serious clinical picture very different from that associated with either gas-gangrene or anaerobic cellulitis. The paper describes what was seen. We do not claim to distinguish between one clinical entity and another but prefer to

2–4 days old, by which time most cases of gas-gangrene in the latest reports have been recognised (Jeffrey and Thomson 1944, Cutler and Sandusky 1944).

INCIDENCE

During the period June 8 to July 24, 3907 battle
6 (11%) of these had been
cillin. These, by virtue of
those most liable to suffer
from gas-gangrene—i.e., wounds with extensive laceration of muscle (especially buttock or thigh), compound fractures, arterial damage, many retained foreign bodies, much contamination, and also those in men who had lain out for a considerable time. Examination of these cases revealed that 94% conformed to these
ribed was an initial
in about 6 hours by
hourly intervals till
definitive surgical treatment could be carried out.

A comparison is drawn, therefore, between the incidence—from the day of wounding till admission to this EMS hospital—in one class of case which was not considered likely to develop gas-gangrene and that in another class specially selected for the opposite reason. Had the selection been perfect, cases of gas-gangrene and allied conditions should only have developed in the second class.

TABLE I—PROPHYLACTIC TREATMENT GIVEN ON DAY OF WOUNDING IN 410 CASES[1] LIABLE TO DEVELOP GAS-GANGRENE

Treatment	% of cases	Treatment	% of cases
ATS	60	AGGS	25
Penicillin ..	42	Surgical intervention	23
Sulphonamides	40		

1. No record of remaining 26.
ATS = anti-tetanus serum. AGGS = anti-gas-gangrene serum.

The incidence of cases diagnosed as "gas-gangrene," "suspected gas-gangrene," or "gas cellulitis" in class I, not treated prophylactically with penicillin, was 28 in 3471 (gas-gangrene 5, 0·14%)[||] or 0·81%. The incidence in class II, treated prophylactically with penicillin, was 2 in 436 (gas-gangrene 0), or 0·46%. Since prophylaxis in any form, for its optimal effect, should begin immediately after wounding, table I indicates the different factors in the second class influencing incidence at the earliest moment. It is thus seen that reliance for protection at this early stage was placed on chemotherapy in almost twice as many cases as on surgical intervention.[¶]

MANIFEST INFECTION

No deaths occurred in this hospital during the time under consideration, although care was taken to keep all serious cases till they appeared to be out of danger and all cases of "gas" diagnosed here were retained till full healing had taken place. The cases studied have been divided into the following clinical groupings—

Diagnosed as "gas"

	No.
Group 1.—First recognised at the EMS hospital	16
Group 2.—Recognised and treated before admission:	
(A) retained 6 (B) sent on 8	14[**]
	30

Not diagnosed as "gas"

	Series 1	Series 2
Group 3.—With "dirty" lacerated wounds treated earlier with prophylactic penicillin	9 ..	27
Group 4.—With "clean" lacerated wounds ..	11 ..	22

[**] These figures include 1 prisoner-of-war not in the investigation.

CASES FIRST RECOGNISED AT THE EMS HOSPITAL

Group 1 comprises all the cases which were first diagnosed as "gas" on admission and were followed throughout. The findings in this group have been made a basis for interpreting those in the other groups and therefore merit the closest study.

Clinical diagnosis.—The diagnosis of gas infection was made by the surgeons on the following clinical criteria:
swelling and
arge,
presence of g
skin,
and general
st be
emphasised
d the
stage of fulminating gas-gangrene as commonly recognised by the surgeon. They would be classified as "anaerobic cellulitis" or "local gas-gangrene" of muscle. The whole aim in treatment was to recognise and treat cases before they reached a stage that may be regarded as the terminal event in an infection of a muscle, no matter how rapidly reached.

In all but 3 instances the most striking feature was the appearance of the muscles. They had greyish sloughing surfaces, were greatly swollen, and were herniating out of wounds or causing very considerable swelling and pain in the limb involved. A thin brownish
were also present.
n over a wide area
rotic muscle which

presence of gas, dis-
on the increasing
pain, pallor, pulse-rate, and swelling of muscles during the first few hours after admission.

Pulse-rates were
peratures. Greyis
surroundings distin
the same convoy.

Bacteriological diagnosis was made both on film and culture. Without exception both supported the diagnosis by showing the presence of gram-positive bacilli which grew only under anaerobic conditions. *Staph. aureus* and *Strep. hæmolyticus* accompanied the clostridia in 6 cases. In 11 instances (which include 2 cases in group 2A) cultures were sent to the Lister Institute for further investigation; *Clostridium welchii* was found in every specimen examined and was accompanied by *Cl. sporogenes* in all but one, while *Cl. tertium* and *Cl. histolyticum* were found in 3 others.

Previous history.—The age of these wounds varied from 1 to 4 days (description in table II). In none had any penicillin or sulphonamides been administered or surgery performed on the day of wounding. One case only had received gas-gangrene antiserum on this day.

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[¶] Summary of report to MRC on transit cases.

TABLE II—PREVIOUS TREATMENT AND CONDITION ON ADMISSION IN 16 CASES OF GROUP 1

PREVIOUS TREATMENT

	Cases		Cases
Surgical { Incision	2	Sulphonamides (7·5–20 g.)	9
Surgical { Excision	2		
Anti-g.-g. serum	2	Penicillin* (3–4 injections)	2

CONDITION ON ADMISSION

Day from wounding:		*State of wound:*	
1st	1	Lacerations	16
2nd	8	Foreign bodies	10
3rd	3	Fractures	6
4th	4	Arterial damage	3
Site:		Odour	13
Buttock	3	Skin discoloration	3
Thigh	3	Nerve lesions	8
Leg	3	Muscles swollen	16
Forearm	3	Muscles discoloured	15
Arm	2	Muscles non-contractile	15
Shoulder	1	Muscles contained gas	11†
Foot	1		
Temperature (° F):		*Bacteriological findings:*	
99° or less	4	Clostridia‡	16
99°–101°	10	*Staph. aureus*	5
101°–103°	2	Hæmolytic strep.	2
Pulse-rate per min.:		*Staph. albus*	9
109 or less	2	*Bact. coli*	2
110–119	6	Non-hæm. strep.	2
120–140	8	Diphtheroids	3
Pallor	14†		

* Penicillin not begun till 1st and 2nd days after wounding respectively. Initial dose 80,000 and 100,000 units, subsequent 40–50 thousand.

† Remainder not recorded.

‡ Film and culture. *Cl. welchii* found in all specimens sent to Lister Institute (11).

Treatment in the EMS hospital.—The patients were brought under treatment at the earliest possible moment after diagnosis. The following programme was found the most satisfactory—

> Immediate injection of 20,000 units of penicillin, repeated at the beginning of operation and thereafter 3-hourly, or by intramuscular drip, for from 10–15 days.
>
> Immediate injection of 50–100 thousand units of gas-gangrene antiserum, repeated if considered necessary.
>
> Wide incision of wounds and excision of only definitely necrotic muscle. No sulphonamides were given.

The lengthy penicillin treatment was thought necessary owing to the observation that the swelling of muscles, clostridial infection, and evidences of toxæmia persisted much longer than the unhealthy appearance of the muscle surfaces.

> As a necessary precaution against secondary infection, penicillin paste, 250 units per gramme, was applied locally as soon as systemic treatment was discontinued and till secondary suture or skin-graft could be satisfactorily carried out.

A little further excision was necessary in 4 cases. Ligature of a vessel for secondary hæmorrhage and sequestrectomy of the spine of a scapula were the only other operative procedures. Blood-transfusions were given to 4 cases. Sedatives were given freely, because the patients were markedly restless and anxious.

Progress was steady throughout. There was little, if any, extension of the necrotic process and surfaces looked clean and became covered with granulations in from a week to a fortnight. The swelling of muscle bellies took longer to subside and was noticeable in some cases as long as 18 days after excision. The general condition of the patients however gave more cause for concern than did the appearance of the wounds. The abnormal mental condition, pallor, and rapid pulse-rate were the most distinctive and protracted features of these patients' condition (see table III).

In the second series, where no case received gas-gangrene antiserum, the 6 cases of persistent *Cl. welchii* infection registered pulse-rates of over 90 per min. for 4–12 weeks after admission, whereas, of the remaining cases, the mean time for the rate to fall below this figure was 1·5 weeks.

Bacteriological progress was followed by swabs taken, on an average, twice a week for the first fortnight, and then at gradually increasing intervals till full healing had taken place. The most noteworthy finding was the length of time before gram-positive rods disappeared [illegible] Cl [illegible] and anaerobic cultures (table III). A notice- [illegible] ture preceding disappearance from films was the increase in atypical morphological forms, while many bacilli showed fragmentation and loss of fixing power for Gram's stain. In spite of increased pus formation, the absence of phagocytosis was noteworthy. The cultural findings were confirmed in 11 cases whose specimens were subjected to more detailed study; *Cl. welchii* was present for as long as, or longer than, gram-positive anaerobes were found in cultures.

This period during which clostridia were found seemed to correspond with the duration of toxic symptoms in the patient, with the proviso that small pieces of slough not removed from the surface of a wound would consistently harbour anaerobes when the patient himself was well on towards convalescence.

Gram-positive secondary infection occurred in half the cases. *Staph. aureus* was the usual invader but *Strep. hæmolyticus* appeared in one wound. Only once, however, did they appear in the first 10 days. By this time the wounds were well covered with granulations and so protected from any spread of infection into the deeper tissues. The wounds did not give any clinical evidence of sepsis before the organisms were detected, but they were undoubtedly associated with the breaking down of suture lines and the partial failure of skin-grafts. When daily dressings of penicillin paste were started as soon as systemic treatment was stopped these secondary invaders ceased to be a source of trouble.

Progress during convalescence.—The hæmoglobin and red-cell count were estimated in two-thirds of the cases. When this was done in the acute phase the Hb was in the vicinity of 30–50%, and in the cases examined 6 weeks after first treatment it had reached 100–110%.

By 3–7 weeks no sinuses remained and wounds were superficial. The last remaining granulations were covered with epithelium in from 4 to 14 weeks, and this included a patient whose whole supraspinatus fossa had to fill with granulations before full healing could take place.

TABLE III—PENICILLIN THERAPY AND PROGRESS IN 22 CASES OF GROUPS 1 AND 2A (FIGURES = NO. OF CASES)

Day from diagnosis	6–8	9–11	12–15	16–32	33–64	65–128
Systemic penicillin* completed	8	9	5	..	..	..
Clostridia disappeared: from film†	8	2	5	6	..	..
Clostridia disappeared: from culture	4	5	4	9	..	..
Pulse-rate below 90 per min.†	3	2	..	11	5	..
Wounds healed	..	..	..	3	16	3

* Local applications of penicillin used after systemic discontinued.

† 1 case not recorded.

The investigation was not considered complete till all cases were taking active exercise, with their wounds fully healed and no other treatment but suturing of nerves and physiotherapy required. Thus it could be said with some certainty that no ill effects from infection or toxæmia remained.

GROUP 2

Cases first diagnosed and treated elsewhere number 13 (table IV). Anaerobic infection was recognised on days 0–3; gas-gangrene on days 1–2. It was in this group only that gas-gangrene occurred and amputation was found necessary. Unfortunately there was no means of comparing the condition of the wounds before gas-gangrene supervened with those in group 1. Penicillin had been administered to all but one therapeutically but to none prophylactically. The administration of sulphonamides and gas-gangrene antiserum was not a constant feature of their treatment. Clostridia were cultivated from every case retained, even from an amputation stump. An abundant growth of *Staph. aureus* was obtained only from the case not treated with penicillin.

Two of these cases deserve mention—

The case in which no surgical intervention was carried out was diagnosed as suspected gas-gangrene on the day of wounding; this man received "5 c.cm." only of gas-gangrene antiserum and regular doses of penicillin from day 1. He

TABLE IV—PREVIOUS HISTORY AND TREATMENT OF 13 CASES IN GROUP 2A AND B

ONSET OF INFECTION	Cases
Day from wounding:	
0	2
1st	5
2nd	4
3rd	2
Site:	
Thigh	2
Leg	4
Forearm	2
Arm	2
Foot	2
Abdominal wall	1
Description:	
"Gas-gangrene suspected"	6
"Gas present"	2
"Gas-gangrene"	5

FIRST TREATMENT:	Cases
Surgical:	
None	1
Excision	7
Amputation	5
Anti-g.-g. serum (units):	
Nil	1
No record	3
11,000	1
45,000 and over	8
Sulphonamides (g.):	
Nil	4
No record	1
10–15	5
20–30	3
*Penicillin** (injections per day):	
Nil	1
2–3	2
4–5	8
Drip	2
Bact. culture on admission:	
Not done	7
Clostridia	6
Staph. aureus	2
Hæm. strep.	0
Staph. albus	4
Bact. coli	1

* Initial dose usually 100,000 units; subsequent doses usually 40,000–50,000 units.

reached the EMS hospital on the 3rd day after wounding with the muscles of his calf yellow-red and herniating out of his wound. A foreign body was found embedded in his calf which had severed his post-tibial artery. Even without early excision or sulphonamides, the gangrenous process had obviously not extended.

The second case was one in which early extensive excision of thigh muscles, removal of a foreign body, and 50,000 units of gas-gangrene antiserum had failed to provent extension of the process into the abdominal wall. When taken to the theatre for amputation on the 2nd day his condition had appeared too serious for the surgeon to risk operation. The regular administration of penicillin in conjunction with [illegible] f gas-gangrene antiserum [illegible] improvement in general [illegible] clean granulating wound by the 12th day, when he was sent to the EMS hospital.

Clinically the 6 cases retained in the hospital closely resembled those in the first group at comparable stages, but the pallor and peculiar mentality associated with [illegible] ll-marked and one case [illegible] atment and progress [illegible] 1, so that as a separate [illegible]

th [illegible] pr [illegible] we [illegible] periods of 1–3 months.

GROUP 3

[illegible]

admission and had ragged greyish sloughing surfaces and much discharge, either thin and grey or bloody and purulent. The septic appearance was however confined to the torn muscles, there being no flush of the sur- [illegible] part or œdema of the skin or subcutaneous [illegible] Nearly all the patients looked ill on admission, [illegible]

of gas [illegible]

Prev [illegible] ual, b [illegible] excep- [illegible] Anti- [illegible] seen in [illegible] tensive [illegible] lacerations had only a negligible amount of sulphonamides—2·5 g. in one; none in the other.

Bacteri [illegible] produced [illegible] to heavy [illegible] f a scanty [illegible] in 1 case, no other recognised pathogens were found.

Treatment.—Penicillin was continued on much the same lines as that already described. Gas-gangrene antiserum was given to one case only.

Surgical intervention.—Excision of dead muscle was necessary in several cases. Removal of loose bone and of tight 'Vaseline' gauze plugging, and the trimming up of the hanging fragments of tissue from a traumatic amputation were also carried out. The insertion of Steinmann's pins had no untoward results and one amputation was necessary.

This case provided perhaps the most suitable conditions for the development of gas-gangrene. He had a 9-day-old perforating wound of the upper arm with a severely comminuted fracture of the humerus. The entry and exit wounds were small, but, because of shock, no previous operation had been performed, the limb being enclosed in a plaster spica. He had been given, in regular dosage during 1 week, enough penicillin to treat a pyogenic infection therapeutically for a month; 9000 units only of gas-gangrene antiserum had been injected on day 1, and no sulphonamide administration was recorded. When the wounds were explored in this hospital no pulsation was felt in the brachial artery. Every muscle of the arm was lacerated, the triceps pultaceous, and the ulnar nerve severed. A quantity of ill-smelling bloody pus flowed out of the wounds as they were opened. Amputation was performed of necessity, for there was little continuity of tissue apart from skin. Though the patient's condition after operation caused considerable anxiety he made a quick recovery and looked bright and well within 5 days of his operation.

In contradistinction to the case just described, who received early and enormous quantities of penicillin, another calls for special comment since it may indicate that inadequate penicillin therapy can mask *local signs* of gas-gangrene though not prevent a profound toxæmia.

TABLE V—PREVIOUS TREATMENT AND CONDITION ON ADMISSION IN 10 CASES OF GROUP 3

PREVIOUS TREATMENT

	Cases
Surgical:	
Nil	3
Toilet	2
Incision	2
Excision	3
Anti-g.-g. serum (units):	
Nil	2
9000–16,000	4
20,000–60,000	4

	Cases
Sulphonamides (g.)	
Nil	4
10–14	2
20 or over	4
*Penicillin** (injections per day):	
2–3	3
4–8	7

CONDITION ON ADMISSION

Day from wounding:	
2nd and 3rd	3
5th and 6th	4
8th and 9th	2
15th	1
Site:	
Buttock, thigh, &c.	3
Whole lower limb, &c.	2
Whole upper limb	1
Thigh	2
Arm	2
Temperature (°F)	
99°–101°	10
Pulse rate per min.	
99 or less	6
100–116	4

State of wound:	
Severe lacerations	10
Foreign bodies	4
Fractures	8
Arterial damage	2
Odour	6†
Pus	5
Muscles swollen‡	1
Muscles discoloured	8
Muscles non-contractile	5
Muscles contained gas‡	2
Bacteriological findings:	
Clostridia§	10
Staph. aureus‡	1
Hæm. strep.‡	1
Staph. albus	4
Bact. coli	5
Non-hæm. strep	2
Diphtheroids	3

* Initial dose usually 100,000 units; subsequent doses usually 40,000–50,000 units.
† 3 cases with no record. ‡ Scanty only. § Film and culture.

His injury, a compound comminuted fracture of the femur, received no medical attention for 21 hours after wounding. Before admission to this hospital some excision and plaster-of-paris splinting had been carried out. Large doses of sulphonamides, in all 51 g. in about 2 weeks, had been administered. Penicillin was not given till day 2, and then for a week; 10,000 units of gas-gangrene antiserum was injected on day 6, although there were *notes* to the effect that there was "no sign of G-G though wound is heavily infected." When inspected in this hospital 15 days after wounding, the wound had some greenish slimy discharge in it and some strands of necrotic greenish muscle, but most of the muscle looked "red and healthy." The film was teeming with gram-positive bacilli, and no other pathogens except clostridia were cultivated from the wound swab.

The patient was obviously ill and a further course of sulphonamides was discontinued when it was discovered that he had a leucopenia of 3000 per c.mm., ulcerated fauces, and mental derangement. A rising temperature could not be accounted for, and, though no diagnosis could be made, as a measure of despair, a further course of penicillin was given for 6 days only. The temperature partly subsided but fever persisted for many weeks, and a pulse-rate of 120 was still being recorded 4 months after wounding. It is also noteworthy that *Cl. welchii* were cultivated from his sinus after this period had elapsed.

GROUP 4

Group 4 were selected as clean wounds irrespective of previous penicillin therapy. They are used simply as a bacteriological comparison with the previous "septic" cases in which clostridia were invariably found (table VI).

TABLE VI—BACTERIA FOUND IN "CLEAN" AND "SEPTIC" WOUNDS IN GROUPS 4 AND 3 (NO. OF WOUNDS)

Group	Type	Total	Sterile	Clos.		*S. aur.*	*H. strep.*	Others†
				Film	Cult.			
4.	Clean	10	5	1 (±)	5 (±)	2	0	4
3.	Dirty*	10	0	10	10	1 (±)	1 (±)	5

* Or "septic."
† Others: *Staph. albus*, non-hæmolytic streptococci, *Bact. coli*, diphtheroids and G + air contaminants.

The second series of 49 consecutive lacerated wounds treated elsewhere and 1–5 days old (table VII) were also compared from this point of view. The "clean" wounds where clostridia were found were little lacerated and thus provided a poor habitat in which their scanty numbers could multiply. Those that were "septic" almost invariably harboured clostridia, almost to the exclusion of other pathogens.

TABLE VII—BACTERIA IN 49 CONSECUTIVE LACERATED WOUNDS OF SERIES 2 (NO. OF WOUNDS)

Group	Type	Total	Sterile	Clos.		*S. aur.*	*H. strep.*	Others†
				Film	Cult.			
4.	Clean	22	10	2	5‡	5	0	8
3.	Dirty*	27	0	21	25¶	2	1	1

* Or "septic."
† Others: Gram-negative bacilli, *Staph. albus*, and non-hæmolytic streptococci.
‡ *Cl. welchii* in 1 wound. ¶ *Cl. welchii* in at least 8 wounds.

Blood-urea was not estimated in the EMS hospital cases but series 2 provides an indication of the effect of clostridial infection on their level. Estimates were made at fortnightly intervals on all cases. Only those which remained over 50 mg. per 100 c.cm. during the first fortnight after wounding are tabulated (table VIII). A second course of penicillin in one patient who received very perfunctory prophylactic treatment was followed by a steady improvement in symptoms and drop in his blood-urea from 420 mg. per 100 c.cm. to normal limits within 3 weeks.

TABLE VIII—BLOOD-UREA LEVELS IN 48 CASES OF SERIES 2 (NO. OF CASES)

Wounds	Total	Blood-urea over 50 mg. per 100 c.cm.	Proportion raised
With clostridia	23	8	1 : 3
Without clostridia	25	3	1 : 8

DISCUSSION

Earlier experimental work has shown the protective value of parenteral penicillin against overwhelming inoculations of clostridia (Chain et al. 1940, Hac 1944). Incontrovertible proof of the part played by prophylactic penicillin in influencing the incidence and the of clostridial infections in man cannot be offered in this small series of cases, nor would anyone care to withhold chemotherapy in order to obtain a significant number of controls. Possibly the incidence of gas-gangrene in the German Army opposing us since D-day may form a basis of comparison later.

Again no claim can be made that any of the 31 cases of clostridial infection followed in this hospital—groups 1, 2A, and 3—would have passed on to the stage of gas-gangrene. The fact can simply be recorded that no case among the 3907 battle casualties did develop it here and the wounds were of the kinds considered most liable to do so. A death from gas-gangrene did occur in a case admitted later than this series when the regime described here was not observed.

The diagnosis of "gas-gangrene" seems to be open to many different interpretations, but from the point of view of chemotherapy it is better to regard clostridial infections of muscle not as separate clinical entities but as a single process that may pass through many stages, no matter how rapidly, from superficial infection to extensive gangrene. "In histological sections clostridia have been found far beyond the edge of the gangrene, in the interstitial tissue between the healthy fibres" (McNee and Shaw Dunn 1917), indicating that bacteria are invading the tissues before gangrene is evident. For this reason, failing prophylactic treatment, the earlier infection is recognised the better chance there will be of arresting its progress. The suggestion is made that swelling of muscles should be taken into account in an attempt to make this early diagnosis.

Chemotherapy can only be expected to play a part where circulatory access to the infected area is adequate; where a major artery is severed and no collateral circulation established there is no means of carrying the antibacterial agent to the affected part. In these cases the infection must be expected to spread at least as far as the barrier set up by the circulating drug.

The cases in group 1, first diagnosed as "gas" at the EMS hospital, provide some valuable information, and help to interpret findings in the other groups:—

(1) that bacteriological findings supported the clinical diagnosis both in film and culture;
(2) that clostridia persisted for a considerably longer period than was suggested by the clean surface of the wound, but that this period was more nearly commensurate with the time during which the swelling of muscles persisted;
(3) that "toxæmia" was a well-marked and protracted feature of most cases;
(4) that infection did not spread after penicillin therapy combined with conservative surgery had been instituted;
(5) that local applications of penicillin provided a protection against secondary infection until the most suitable time for reparative surgery.

The use of gas-gangrene antiserum was not considered in any way to confuse the issue of the investigation. The employment of a powerful antibacterial agent to check the spread of an infection could not be expected to reduce the circulation of the toxins already present, nor could there be any guarantee that clostridia lying in the muscle would not, though prevented from multiplying, still generate toxins until they eventually disappeared. In the same way, surgery was manifestly required to remove dead tissue which might continually renew infection and maintain toxin formation, and was beyond the reach of circulating drug and antibodies.

It is regrettable that during the stress of the convoys blood-urea estimations were not made at the hospital for cases have already been reported who have died in uræmia during a course of penicillin therapy which was instituted after gas-gangrene was well established (Jeffrey and Thomson 1944, and unpublished reports), and a raised blood-urea seems often to be present even before the well-developed stage of gas-gangrene (table VIII).

Group 2, diagnosed and treated before reaching the EMS hospital, calls for some comment. Amputation beyond the sight of visible infection was not a guarantee that clostridia were absent (see also McNee and Shaw Dunn 1917). A later case bore out clinically this bacteriological finding—a man died in the hospital from gas-gangrene without receiving penicillin after amputation had been performed elsewhere.

That "gas" diagnosed on the day of wounding could be stopped from spreading simply by the use of systemic penicillin and a minimum dose of gas-gangrene antiserum seems to be demonstrated by a case in group 2. The muscles when examined on the 3rd day were obviously pathologica

The "septic" or " ously
treated with penicill gas,"
all harboured clostrid other

pathogen but clostridia, did they neither pass on to "gas-gangrene" or even show the additional clinical signs of swollen muscles and presence of "gas"? No answer can be incontrovertible, but their one common factor in treatment was penicillin. The suggestion is made that the drug prevented any spread beyond the superficial layers of the torn and devitalised muscles. Even this limited infection was apparently sufficient, at any rate in one case, to produce a profound toxæmia, counteracted as it was by no more than 16,000 units of gas-gangrene antiserum.

A satisfactory basic dosage and time interval has been worked out for the penicillin therapy of pyogenic infections—15,000 units 3-hourly—but not for those caused by anaerobes. Obviously in so rapidly spreading a condition as gas-gangrene the optimum treatment is prophylactic, beginning by an injection immediately after wounding. The intervals recommended by the War Office have not yet been demonstrated to be adequate for the purpose, though the doses are much larger than those commonly used. It is possible, however, that a wound may be flooded from a large dose of penicillin and retain the drug considerably longer than it is demonstrable in the blood-stream. Even if the bacteriostasis in the blood-stream was intermittent (and very few cases received even the number of doses prescribed), it must have had a considerable effect, as shown by the small proportion of wounds so treated which harboured *Staph. aureus* and *Strep. hæmolyticus* (Berry et al. 1944). Clostridia, however, persisted in a higher proportion, and though producing no typical local signs of gas-gangrene appeared in some cases to give rise to generalised symptoms when only partially controlled by a short or interrupted course of penicillin. Such cases might confuse the surgeon at the base hospital by showing only local sepsis but a profound toxæmia with a high blood-urea from which the patient might not recover.

The clean wounds (group 4, series 1 and 2) were selected simply on clinical grounds in order to compare their bacterial flora with the preceding groups. The high proportion of sterile wounds and the absence or scanty growth of clostridia from them are both notable features. It seems possible that a lacerated wound where

providing requisite conditions for their multiplication are supplied (as exemplified in group 3, series 1 and 2).

SUMMARY

A study of the manifestation of clostridial infection among nearly 4000 consecutive battle casualties has been made with special reference to the part played by penicillin in combating them.

Some indication that penicillin has lowered the incidence of gas-gangrene is given by comparing the figures in the group not considered liable to develop gas-gangrene—0·14%—with those in the "PEN" label group—specially selected for this liability—0 cases.

It is suggested that cases liable to develop gas-gangrene should receive a penicillin injection as soon as possible after wounding and treatment should be continued till granulations have formed on the wound surface.

A satisfactory
gas-gangrene or "
This includes int
gas-gangrene antiserum, wide incision of wounds with excision of necrotic muscle, and local application of penicillin paste after the systemic course has ended.

Clostridia can be solely responsible for wound sepsis, and not only associated with the clinical entities described as "anaerobic cellulitis" and "gas-gangrene."

With a short or interrupted course of penicillin a profound or protracted toxæmia may result in spite of the absence of typical local signs. In such cases the diagnosis may be missed and the patient fail to receive further penicillin or gas-gangrene antiserum.

This work could not have been carried out without the help given by the staff of the EMS hospital, lay, administrative, nursing, surgical, and laboratory. Other students of St. Thomas's Hospital as well as the authors took part in collecting the data and were unstinted in their efforts to make the records complete. Captain A. E. Brower, RAMC, is thanked for his assistance with the bacteriological investigations, and Dr. M. G. Macfarlane of the Lister Institute for forwarding the relevant bacteriological reports. The Radcliffe Penicillin Unit of the Medical Research Council gave permission for the figures relating to their cases to be published. Thanks are due to Drs. W. R. Ross and E. C. Turton for their help in this work. Dr. M. A. Jennings and Lieut.-Colonel J. S. Jeffrey gave valuable advice and criticism of the text.

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SUBCAPITAL FRACTURES OF FEMORAL NECK

FIXATION BY PIN AND GRAFT

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THE introduction of the three-flanged nail by Smith-Petersen (1931) revived great interest in the treatment of the subcapital fracture of the neck of the femur, on which little fresh work had been done since that of

the behaviour of bone in general and joints in particular.

During the last ten years I have followed 50 of these cases under my care, commencing with the introduction of the nail by open operation, turning to the closed method with guide and X-ray control (Sven Johnsen 1932, Brittain 1930) as its advantages became apparent, and finally using the combination of pin and bone-graft to be described in this article.

HINDRANCES TO BONY UNION

In the treatment of these cases the ease of nursing produced by internal fixation of the fracture and the production of safe anæsthesia for the aged patient are the two practical points which have ranked foremost, but discussion can best be begun by considering the factors concerned in the production of bony union in a fracture of the femoral neck.

Whitman claimed 60% union by bone using external fixation of the fracture by a plaster spica. This was a tremendous step forward compared with the crippling or death which were accepted as the usual results of the injury up to his time, and his writings make it clear that he thought that adequate immobilisation of the fracture was the reason for his success. This argument was carried a step further by many of the early advocates of pinning. They held that complete fixation of the fracture would produce 100% bony union, and what more complete fixation could there be than that provided by a central nail? My own figures (63% bony union in closed nailing, see table) do not support this view, even allowing for initial failures in technique, and the aphorism "the bad results of pinning are the

RESULTS OF CLOSED NAILING WITH AND WITHOUT BONE-GRAFT

(A) CLOSED NAILING WITHOUT GRAFT; BONY UNION IN 12 OUT OF 19

(B) CLOSED NAILING WITH GRAFT; BONY UNION IN 12 OUT OF 14

Case	Sex and age (yr.)	Result	Case	Sex and age (yr.)	Result
1	F 74	Pin broke out *	20	F 50	Bony union
2	F 58	Pin broke out †	21	M 63	Bony union
3	F 68	Pin broke out	22	F 59	Bony union
4	M 59	Bony union	23	F 52	Bony union
5	F 60	Pin extruded ‡	24	F 65	Bony union
6	F 81	Bony union	25	M 59	Died ¶
7	F 69	Bony union *‡	26	F 52	Bony union
8	M 70	Bony union	27	F 53	Bony union
9	F 62	Bony union ‖	28	F 58	Bony union
10	F 65	Bony union	29	M 32	Bony union
11	F 84	Bony union	30	M 41	Bony union
12	M 69	Bony union	31	F 60	Pin broke out **
13	F 87	Bony union	32	M 71	Bony union
14	M 68	Pin broke out *	33	F 74	Bony union
15	F 65	Bony union			
16	M 67	Bony union			
17	F 65	Bony union			
18	F 76	Pin broke out			
19	F 71	Pin broke out			

Total cases, 50. The previous 17 cases were dealt with by open operation: only one of these is recorded as breaking out.

* Head necrotic in radiogram. † Pin wrongly placed. ‡ Accurate nailing. ‖ Hip ankylosed later. § Diabetic. ¶ Died in uræmic coma at 8 weeks. ** Head fragmented.

results of bad pinning" is not borne out in fact. Surgeons began to mention aseptic necrosis of the head of the femur as these cases were studied, and it became plain that the blood-supply to this part, notoriously deficient in some people, had a lot to do with union or non-union of the fracture. Also—as has been observed in the late removal of Lane's plates, with their sterile abscesses—many kinds of metal irritate human tissue, delaying union; there are a few which are inert.

The most important point has been well illustrated by the researches of Urist and Johnson (1943) into the healing of fractures in man. They have shown that in flat bony parts (e.g., trochanters of the femur) union occurs readily at a fracture by direct growth of bone across the fracture line. In tubular bony parts union is produced by the throwing across of a bridge of external callus from the parts beyond the fracture line, a much more lengthy and difficult process which depends on an adequate supply of healthy bone in the locality. This condition is often not fulfilled in the neck of the femur, which is, from the fracture point of view, a tubular bone.

BREAKING-OUT OF THE PIN

No-one who has dealt with any large number of these cases can have escaped the disappointment of seeing, during the first fortnight after fixation, the foot slowly evert and the leg adduct at the hip; while X-ray films in the same period show the pin ploughing its way upward and forward through the head of the femur into the hip-joint. The whole process is accompanied by pain, which is conspicuously absent in the normal convalescence of these patients. At first one blamed faulty technique for this—only to see, later, a nail placed dead-centre do the same thing. Then aseptic necrosis of the femoral head seemed the likely explanation, but a radiogram (fig. 1) showing the necrotic head firmly held on the pin put this out of court also (case 7 in table).

In connexion with the breaking-out of the pin two facts have impressed themselves on me as the cases have been followed. First, the broken-out pin has become more common since the method of closed insertion (using a guide and pin with a central cannula) was introduced. Out of 17 cases in which the pin was introduced by open operation only one is recorded as breaking out, although this operation was unsatisfactory from many other points of view. In 19 cases of closed nailing (see table) 7 are recorded as breaking out—at least 1 in every 3 operations.

Secondly, whenever such a failure has demanded removal of the pin large quantities of joint fluid have invariably escaped from a sac around the metal head, and more fluid has flowed down the track in the bone from which the pin was removed. This is in direct contrast to the condition found when a pin is removed after, say, 2 years in a case where bony union has been established—no fluid is found there; metal fits snugly to bone and fair force is necessary for the withdrawal. There are only two ways in which such joint fluid could trickle between pin and bone: either as a result of the guide wire being pushed too far in during the early stages of the operation, thus perforating the articular cartilage of the femoral head; or through the bone surfaces at the fracture site being distracted. Both can happen easily if care is not taken, and my impression is that perforation of the articular cartilage is the commonest cause of the trouble.

ANÆSTHESIA, NURSING, AND AFTER-CARE

Whatever benefits may be derived from internal fixation of this fracture they are not worth serious consideration unless they can be applied to the aged patient, for it is here that the subcapital fracture carries its greatest risks. An anæsthetic is therefore required which is safe for old people, lasts for an hour or more, produces no shock, and leaves no serious after-effects, particularly in the chest.

The ideal agent has been found in hypobaric 'Nupercaine' (1 in 1500) with premedication by 'Omnopon' and scopolamine. The skin at the site of lumbar puncture is infiltrated with 1% 'Novocain' containing adrenaline and the nupercaine is injected while the patient lies on the sound side with the injured leg supported and the whole table in about 15° Trendelenburg position. This ensures that only the affected hip and leg are anæsthetised, that the intestinal capillary field is not paralysed, and that there is no serious drop in blood-pressure. Once the nupercaine is fixed the patient can be restored to the supine position. Between 9 and 11 c.cm. of the solution are required, according to the patient's size, and he will often go to sleep during the operation; but care must be taken not to interfere with any other part of the body than the injured leg, since anæsthesia is sharply limited. It is not claimed that this anæsthetic can be administered to any patient, but provided that the blood non-protein nitrogen is not higher than 45 mg. per 100 c.cm. and blood-pressure readings remain steady over 2–3 days with the patient at rest, it may be given with safety whatever the patient's age.

With adequate internal fixation of the fractured neck of femur the patient can sit up, move round in bed, and be free from pain and discomfort; hypostatic pneumonia and bed-sores, those twin bugbears in the nursing of old people, are therefore eliminated. What this means can best be judged by the reactions of nursing staffs who have previously had to cope with

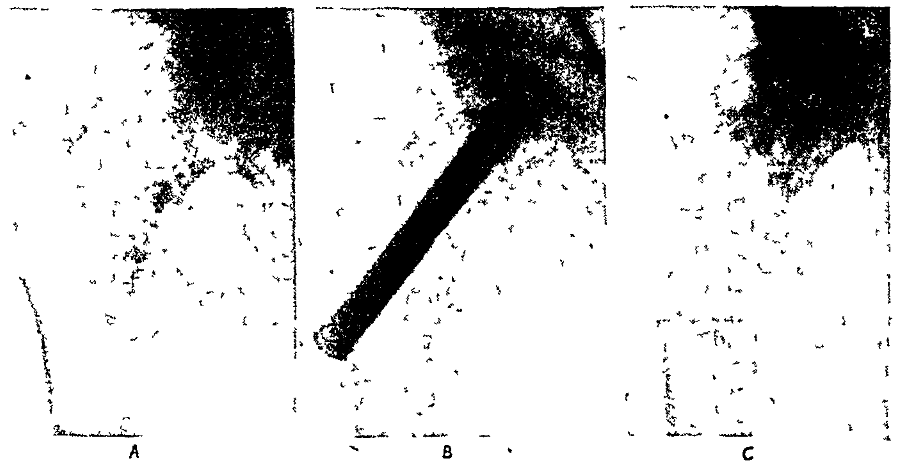

Fig. 1—Case 7. Necrosis of the head of the femur without breaking-out of the pin. A: July, 1940, before [illegible] B: September, 1942, head of femur necrotic. C: October, 1942, union established, after [illegible] of pin.

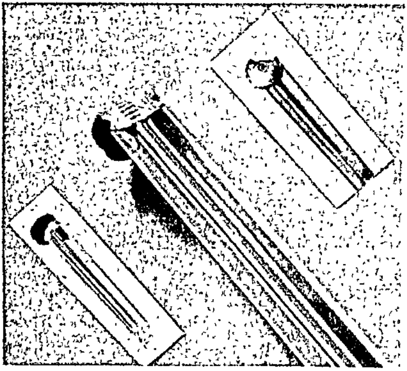

Fig. 2—Nail with segment of head ground out, used for combined pin and graft.

these people in plaster spicas or splints. In addition, incontinence, so common in the elderly, can be dealt with at a minimum of trouble. Weight-bearing should not be allowed until at least 2 months have passed without any evidence of the pin breaking out. Some surgeons prefer to wait until X-ray films show bony union.

It seems, therefore, that the indications for plain pinning of the subcapital fracture of the femur are as much general as local—in fact, in many instances the general considerations far outweigh the local ones, because protracted suffering and difficult nursing can be avoided. How, then, can an increased percentage of bony unions be combined with these general advantages?

FIXATION BY PIN AND BONE-GRAFT

xation by combined pin n for both pin and graft and in making sure that

The patient, anæsthetised as described, is placed on a traction table, and, the fracture having been reduced, position is fixed. The head of the femur is then indicated on the surface by placing a single Michel clip ¼ in. lateral to the femoral artery in the line of Poupart's ligament, and two X-ray films, anteroposterior and lateral, are taken to check the reduction. After suitable skin preparation, operative fields at hip and shin are towelled off and the films inspected to prove reduction, particularly in the lateral view; if reduction is not complete the necessary adjustment is made now. The lateral surface of the femur is exposed at the point where trochanter curves into shaft and the cortex is broken through with a moderate-sized drill;

Michel clip, which can be seen both on the patient and in the antero-posterior film, and from the angle of anteversion of the femoral neck, which is demonstrated in the lateral radiogram. The tip of the guide should never be made to penetrate further than 3¾ in. from the outer surface of the femoral shaft, and in practice it is found that there are three common lengths of the neck of the femur, 3⅞ in. in a large man, 3⅝ in. in a small man or average sized woman, and 3⅜ in. in a small woman.

A second set of X-ray films

type; a segment of the head corresponding to the gap between two flanges of the pin is ground out (fig. 2). One of suitable length is selected and tapped home along the guide; the length can be calculated accurately from the length of guide protruding from the cortex of the femur. With the nail inserted the guide is withdrawn and an ordinary ¼ in. twist drill is applied to the bony surface opposite the gap in the nail-head; with the drill bearing all the time on the groove between the nail fins, a hole is drilled across the site of fracture. Next a graft of the tibial crest, triangular in cross-section (Albee 1940) of the required length is cut and hammered into the drill-hole in the femoral neck; the disparity in cross-section ensures a firm hold. Both wounds are then closed and two final radiograms are taken for purposes of record.

It is advisable to fix the leg on a simple back-splint for some days, otherwise patients complain of pain in the shin; they never complain of pain in the hip unless the pin is going to break out. No other fixation is required, the patient is allowed to sit up as soon as he wants to, and is encouraged to move the leg from the start. Most patients have a full range of active hip movement in a fortnight. Weight-bearing is forbidden for 2 months.

The table shows the results of the method in 14 cases: bony union was achieved in 12. Figs. 3 and 4 (cases 22 and 24 in table) show the X-ray findings in two cases treated by the combined method.

CONCLUSIONS

The general indications for plain pinning of fractures of the neck of the femur far outweigh the local ones.

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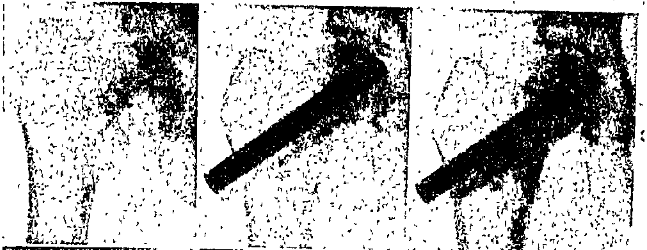

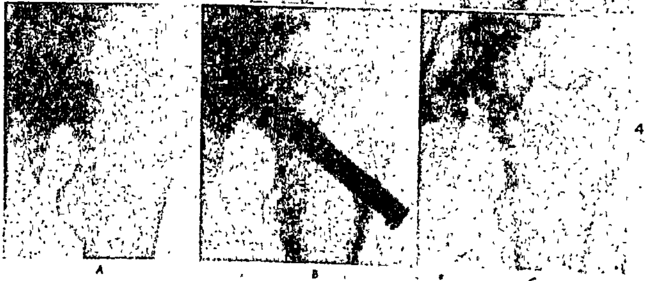

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Fig. 3—Case 22. Combined operation of pin and graft A: September, 1943, before operation. B: October, 1943 C: January, 1944.

Fig. 4—Case 24. Combined pin and graft operation. In this patient the fracture was 8 weeks A: May, 1942, before operation. B - December, 1942. C: September, 1943, pin removed

The most suitable anæsthetic for this operation is hypobaric nupercaine. It is applicable with safety even to the very aged, concentrates the anæsthesia on the area desired, and can be so handled as to avoid any serious drop in blood-pressure. Operation is contra-indicated with a blood-urea exceeding 45 mg. per 100 c.cm.

Breaking out of the nail seems to be connected with perforation of the articular cartilage of the femoral head, which allows synovial fluid to leak down the central cannula of the pin.

The results of the combined pin and bone-graft operation suggest that this method adds a greatly increased chance of bony union to the nursing advantages inherent in internal fixation. The introduction of the bone-graft adds nothing to the risk and little to the technical difficulty of nailing.

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MULTIPLE ATTACKS OF CEREBROSPINAL FEVER

W. F. Corfield, M D LOND., D P H

MEDICAL OFFICER OF HEALTH, COLCHESTER

It seems probable that the man whose history is summarised below had four attacks of meningococcal meningitis and one attack of meningitis due to *N. catarrhalis*. The periods between these attacks were 2 years between the first and second attacks, 14 months between the second and third, just one year between the third and fourth, and 8 months between the fourth and fifth.

A private in the Army was admitted to a military hospital with meningitis on Nov. 9, 1939. He was sent from there to the Royal Herbert Hospital, Woolwich, and then to the Brook Hospital of the London County Council.

Purulent fluid from a lumbar puncture at the Royal Herbert Hospital showed a few organisms, in pairs, partially gram-positive and long in shape for meningococci, one or two pairs being intracellular. A flocculation test was positive with group 2 (types 2 and 4) antimeningococcal serum. While in the Royal Herbert Hospital and Brook Hospital he received full doses of sulphapyridine and 50 c.cm. of group 1 anti-meningococcal serum intramuscularly. He made an uneventful recovery.

In November, 1941, the patient was examined by a specialist for headaches which had been present since the attack of meningitis in 1939. He described the pain as a variable one at the back of the head, which came on after exertion and felt deep in the head; the eyes watered but vision was normal. He experienced no vomiting and slept well. He was worried about home affairs and his memory was affected. The headache was eased when he was lying down. He appeared to be dull and forgetful. He was slightly deaf in the left ear. Pupils were active; irises normal; fields of vision full. Reflexes, heart, chest, and abdomen were all normal. The specialist considered that the headaches were genuinely postmeningeal, and that the man was suffering from faulty memory and depression; he advised grading down to category E, since improvement was unlikely.

On Nov. 19, 1941, he was admitted to Worthing Hospital with symptoms of meningitis. Lumbar puncture produced a turbid milky fluid in which some gram-positive diplococci but no meningococci were found. Cultures on blood-agar produced no growth in 24 hours. This specimen was taken on Nov. 19 but was not received at the laboratory until the 21st, a fact that is adversely commented on by the pathologist. By Dec. 8 he had recovered, after treatment with sulphapyridine, and on Jan. 22, 1942, he was medically boarded and discharged from the Army as permanently unfit. He left the Army on Feb. 27, 1942, and became a lorry driver. He suffered from headaches at irregular intervals and these began about 3 months after each of the attacks. They were relieved by aspirin.

Jan. 30, 1943, the man was admitted to the Colchester ion Hospital with meningitis. Lumbar puncture produced 20 c.cm. of turbid fluid which after a long search was found to contain a few gram-negative cocci resembling meningococci. A culture grew meningococcus, group 2. He was treated with full doses of sulphapyridine and made an uninterrupted recovery. He was discharged fully recovered, except for slight deafness in the left ear, on Feb. 17, 1943.

Almost exactly a year later the patient was again sent to the Colchester Isolation Hospital with meningitis. He was admitted on Jan. 19, 1944, and his spinal fluid was found to contain gram-negative diplococci. A culture grew meningococcus, group 2. Again he made an uninterrupted recovery with sulphapyridine, and he was discharged well on Feb. 12, 1944.

After this attack he appeared to be quite well, but it seemed worth while to seek expert opinion on the condition of his sinuses. The specialist reported: "He has had a submucous resection some 10 years ago, and he still has a rather blocked nose due to hypertrophic rhinitis. The transillumination was clear and there was no obvious pus in the nose or in the postnasal space." The specialist took washings of his antra, though he found no obvious sinus infection, but he did not consider his tonsils very healthy. The report of the pathologist on the antral washings was: "Film, no pus cells or organisms seen; culture, moderately profuse growth of pneumococcus, in almost pure culture."

Eight months later the patient came to the Colchester Isolation Hospital saying he had an attack coming on. This was on Aug. 15, 1944. He complained of severe headache and dizziness since early morning. He was admitted at once but fell down unconscious and delirious before he could be got into bed. Four c.cm. of turbid fluid from the spinal canal revealed no organisms under the microscope but a pure culture of *N. catarrhalis* was grown from this fluid. He made an uninterrupted recovery under treatment, first with sodium sulphapyridine intramuscularly and then with tablets of sulphapyridine. His recovery on this occasion was extremely rapid. He appeared to be perfectly well 3 days after his admission to hospital. While in hospital his temperature was normal during the whole period of this attack. The cerebrospinal fluid was again examined on Aug. 28, 1944. The pathologist's report read: "4 c.cm. colourless, slightly turbid fluid; 4 white cells per c.mm. (lymphocytes); protein 20 mg. per 100 ml.; culture sterile."

The patient's wife was interviewed 2 months later and reported that he was quite well, and free from headaches or deafness.

DISCUSSION

There is no doubt that this man had attacks of cerebrospinal fever due to the meningococcus in 1943 and 1944. His previous attacks in 1939 and 1941 may have been due to the pneumococcus. But it should be noted that in 1939 a flocculation-test was positive with group 2 antimeningococcal serum and that the specimen of spinal fluid in 1941 was delayed for 2 days before arriving at the laboratory. In August, 1944, his attack of meningitis was due to *N. catarrhalis*.

There are many reports of recurrences of cerebrospinal fever after short intervals, and Denis Brinton (1941) says: "Recrudesences of meningitis occurred in a small number of cases in every epidemic before chemotherapy." And he quotes Worster-Drought and Kennedy as describing a recrudescent form of the disease interspersed between apyrexial periods of not more than five or six days.

Arnold Netter (1919), when discussing late relapses in meningococcal cerebrospinal fever, quotes the case of a corporal of the 69th Regiment published by Boudin, who had four recurrences. But all were within 6 months, the longest interval between two attacks being under 3 months; in fact these were recurrences and not second attacks. He also quotes Boudin as having seen a soldier with a severe attack in 1851 who had had previous attacks in 1849 and 1850. Netter also refers to a case of North who had two attacks with an interval of 25 months between them; a case of Hermann and Kober with an interval of one year; and a case of de Warschauer who had a second attack after 5 years.

No satisfactory explanation of these second attacks is suggested. Netter says: "These relapses at short intervals have become less common thanks to the use of polyvalent sera." Whereas 20 years later Brinton says: "Recrudesences of meningitis do not happen, if sufficient doses of the sulphonamides have been given early enough and often enough."

SUMMARY

A soldier had five separate attacks of meningitis. The meningococcus was not seen or isolated from the cerebrospinal fluid during the first two attacks, though what appeared to be gram-positive cocci (? pneumococci) were seen in the films. In the first attack a flocculation test was positive with group 2 antimeningococcal serum. In the third and fourth attacks meningococci were seen in the films and cultured. Probably the first four attacks were due to the meningococcus. The fifth attack was due to *N. catarrhalis*. The intervals between the attacks were 2 years, 14 months, 1 year, and 8 months. Pneumococci were grown from the man's antra.

Recurrences of cerebrospinal fever after short periods have been recorded, but there are few published examples of true second attacks.

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MIKULICZ PACK USED IN A THORACIC WOUND

ALAN RUSCOE CLARKE, MBE, MB LOND., FRCS
MAJOR RAMC

FROM time to time cases are seen at forward operating centres where speed in surgery is a decisive factor. The closure of a wound in the chest or abdomen by ordinary methods may be incompatible with the survival of the patient. In several desperate cases I have attempted to close [illegible] pack. [illegible] use of [illegible] an enor[illegible]

The [illegible] Henry, [illegible] how the Mikulicz pack can be employed in non-tuberculous empyema. The principles involved are in some ways different from those in wound surgery, but Henry's paper should be consulted for his account of the history of the method and references to its previous use in thoracic surgery.

CASE-HISTORY

A signalman, aged 31, was wounded at 1 PM on Nov. 5, [illegible] He was admitted to the for[illegible] pale, cold, and [illegible] 80/50 mm. Hg. A sucking wound of the right chest was temporarily controlled with a 'Vaseline' gauze pack. There was a large right hæmothorax. A blood drip was started and his colour improved slowly, though he remained severely dyspnœic. His pulse-rate increased to 150 and after several hours his blood-pressure began to fall. He was taken to the theatre after receiving four pints of blood on the presumption of continued severe intrathoracic hæmorrhage. He was then unable [illegible] was anæsthetised [illegible] 0·25 g., nitrous oxide, oxygen, and a trace of ether, and an intercostal block with 40 c.cm. of 1% 'Nuvutox.' Large sucking entry and exit wounds of the right lower chest were joined by an incision through skin and muscle, to reveal a completely shattered segmen[illegible] rib fra[illegible] of the [illegible] the di[illegible] surfac[illegible] not su[illegible] ping [illegible] intra-[illegible] fore p[illegible] bleedi[illegible] place[illegible] towel was inserted into the wound and packed on the inside with rolls of gauze so as to exert even pressure on the wound margins and on the raw surface of the liver. Three sutures [illegible]

The man's general condition at the end of the operation was improved, though his pulse-rate remained at 150 per min.

Postoperative treatment: concentrated plasma 1 pint, followed by glucose-saline; penicillin 15,000 units intramuscularly 3-hourly; sulphadiazine 3 g. 12-hourly into drip until conscious; oxygen from BLB mask; catheter on constant suction. The penicillin dosage was continued until Nov. 15. On Nov. 6 he was started on sulphathiazole 1 g. 4-hourly.

Nov. 7: General condition improved. T 98° F, P 130, R 30. Dullness at right base; breath sounds absent; apex beat in 5th space 2 in. outside midclavicular line. Urinary difficulty; catheterised.

Nov. 8: Urine contained albumin and sulphathiazole crystals. Sulphathiazole discontinued.

Nov. 10: General condition excellent.

Second operation.—Under intratracheal nitrous oxide, oxygen, and ether the dressings and pack were removed. A moderate amount of necrotic muscle was excised, the broken ends of five ribs resected, and the diaphragm sutured. A rubber drain and a gauze pack were brought out from the liver area below the diaphragm through a stab wound. A large intercostal catheter was inserted above the posterior end of the wound. The wound was closed by suture of the divided overlying muscle to the remains of the intercostal tissues. The thoracic cavity was thereby made airtight.

Postoperative treatment: concentrated plasma 1 pint, glucose-saline 2 pints, anti-gas-gangrene serum 33,000 units intramuscularly for 3 days; constant suction on catheter, and penicillin 60,000 units given slowly through tube. (Suction was stopped for an hour after insertion of each dose of penicillin.)

Nov. 11: General condition excellent; pleural drainage produced 1 pint bloodstained fluid.

Nov. 12: Red cells 2,700,000 per c.mm. Given blood 1 pint.

Nov. 15: Re-dressed; liver pack partially withdrawn.

Nov. 16 and 17: General condition excellent; some serous oozing from wound. White cells 16,000 per c.mm. X ray shows almost complete expansion of right base with very small quantity of fluid.

Nov. 18: Re-dressed in theatre. Intercostal catheter removed. Muscle suture line had broken down leaving a single local cavity completely shut off from the pleura. Rubber drain in lower stab wound. Penicillin started again, 15,0[illegible] 3-hourly. [illegible] good condition. [illegible] sequent report said that his wound had been sutured (*third operation*) and was almost healed, and that he was up and about on Dec. 24.

COMMENT

It is to be noted that the Mikulicz pack was used in the first operation to close the thoracic cavity and to check bleeding in the thoracic [illegible] that this patient's life [illegible] and speedy measure. [illegible] operation that at least 30 minutes was necessary for even minimal excision and closure by suture.

The second operation (excision and suture after multiple rib-resections), while not resulting in primary union, enabled the lung to be re-expanded. This was facilitated by the use of constant suction, using the three-bottle method already in routine use for gastric suction.

Penicillin and sulphathiazole were used together until renal irritation was suspected. [illegible] for the combination, but I [illegible] less happy performing the [illegible] closure without penicillin.

SUMMARY

A man with a large right-sided injury to the thoracic wall, with damage to lung and liver, was in a desperate condition at time of his original operation. Closure of the cavity and hæmostasis were secured by using a Mikulicz pack. The method may be useful in other desperate cases with large parietal defects of thoracic or abdominal walls.

My thanks are due to Captain R. A. Moir, the physician responsible for detail of aftercare, and to Prof. A. K. Henry for reading the proofs.

Reviews of Books

Exercises in Human Physiology

Sir THOMAS LEWIS, CBE, MD, FRS, FRCP, physician in charge of department of clinical research, University College Hospital, London. (Macmillan. Pp. 103. *3s. 6d.)*

THIS book gives more than it professes, and every medical student should buy it. Thirty-three sets of short exercises are prescribed, mostly on the cardiovascular and "cutaneous" systems of man. Apart from their intrinsic value they are worth reading for the characteristic clarity of the instructions and the simplicity and significance of the deductions which are drawn. Sir Thomas Lewis felt that the transition from preclinical to clinical studies was the most difficult period for the medical student, and the book is a contribution to "human" physiology which he regarded as the best bridge. In many physiological laboratories most of the experiments are now made directly or indirectly upon the human subject, and it is questionable whether this kind of work should be postponed to the end of the preclinical course. All the while he is studying anatomy, physiology, and biochemistry the student must be saturated with those ideas in terms of which he will think for the rest of his life. It is itself a sustained period of transition, and it carries two dangers: first, that he will not acquire sufficient knowledge and sufficient ease in handling it; and secondly, that in the strain of dealing with so much that is unfamiliar he will lose his common-sense. The exercises provided in this small book are a valuable safeguard against the latter catastrophe. Many of them are observational and furnish not only an introduction to clinical methods, but a demonstration that in spite of the elaborate nature of much physiological apparatus, the ordinary everyday methods of reasoning from direct observation are not only possible but necessary and important—the fundamental basis, in fact, of experimental work of every kind. It is as essential for the student to keep his feet on the ground during his preclinical course as to find his feet afterwards, and by fulfilling the first requirement he may make the second very much easier.

Traumatic Injuries of the Facial Bones

J. B. ERICH, MS, DDS, consultant in laryngology, oral and plastic surgery, Mayo Clinic; L. J. AUSTIN, DDS, FACD, head of the section of dental surgery at the clinic. (Saunders. Pp. 600. 36*s.*)

THE authors have produced a good atlas of treatment for the simple injuries of the facial bones, though they are less successful in their account of serious conditions. Each type of injury is illustrated by plaster models, and a brief summary describes a method of treatment for each. The need for removal of teeth in the fracture line is emphasised, and the few occasions in which such teeth may be left are thoroughly impressed upon the reader. They also stress the importance of an adequate plan of therapy, but they are on less sure ground in advising that, in serious cases, the soft-tissue injury should receive immediate treatment and the bony injury be left until a later date: experience with battle casualties has shown us that the early and accurate reduction of the bony framework must be regarded as basic in this type of surgery. Moreover, they might explain how, after sawing through a plaster model at the site of fracture, they are able to mount these fragments in proper alignment to each other and to the upper plaster model, in order to construct their acrylic splint. The technical difficulties of such a procedure are very great. The method of treatment described for backward displacement of middle-third fractures is elaborate and uncertain, and the treatment suggested for comminuted mandibular fractures, and the preparation for bone-grafting, are scarcely in line with modern thought. Our own war experience has taught us that a traction device attached to a plaster head cast is useless in the treatment of depressed pyramidal fractures of the maxilla, and that complicated intra- and extra-nasal devices attached to a plaster head cast, to maintain reduction of facial fractures are to be

All the injuries are beautifully illustrated and described, but it seems that the authors had had little or no war experience when the book was written. It is a safe guide only to the treatment of simple fractures.

Medical Societies

SOCIETY OF MEDICAL OFFICERS OF HEALTH

AT a meeting of the fever group on March 9, with Dr. M. MITMAN, the president, in the chair, a discussion on the

Epidemiology and Treatment of Some Eye Infections

was opened by Prof. ARNOLD SORSBY. Provisional analysis of 9622 blind certificates in the counties of London and Middlesex area shows, he said, that 1427 persons (or 15%) were blinded by infectious disease. In about two-thirds of this 15%, ophthalmia neonatorum and syphilis were responsible, ophthalmia neonatorum being the cause in 265 cases, congenital syphilis in 516, and acquired syphilis in 290. The remaining third is chiefly contributed by trachoma (134) and the various specific fevers (103). The low incidence of infectious disease amongst the causes of blindness in England and Wales is in striking contrast to that found in countries like Egypt, and the Middle East generally, where over 80% of all blindness is caused by infections—mainly the acute ophthalmias, and to a lesser extent trachoma. Infection was formerly the major cause of blindness in England also; at the beginning of the last century smallpox was the largest single factor, and towards the end of the century ophthalmia neonatorum. Even as late as 1922 some 30% of all children at blind schools had been blinded by ophthalmia neonatorum; but by 1942 the incidence had declined to about 10%. The emphasis has shifted from infection to other factors—genetic anomalies in the young and degenerative lesions in the elderly.

Though the eradication of blindness due to infectious disease appears likely within measurable time, there is still much eye disease from these causes. It is disquieting that, though the incidence of blindness from ophthalmia neonatorum has reached vanishing-point, there is no evidence that ophthalmia neonatorum itself has declined considerably. A clearer appreciation of its ætiology is needed, especially as it is now established that only some 20–25% is gonococcal, and that at least 10% is due to virus infection. While congenital syphilis has also declined to a gratifying extent, other transmitted maternal infections—such as toxoplasmic choroidoretinitis—are only now being recognised. The decline in the incidence of trachoma in childhood has brought out the fact that there is still a residue of trachoma in adults, which is a possible source of epidemic outbreaks. Intensive application of the modern procedures for the study of virus diseases is urgently needed in ophthalmology.

The sulphonamides and penicillin are proving an immense help in the treatment and elimination of infectious eye disease. In ophthalmia neonatorum oral administration of the sulphonamides and local application of penicillin easily control this otherwise serious affection. The acute ophthalmias of tropical and subtropical countries likewise respond well to the sulphonamides. In trachoma local application of the sulphonamides has made the classical remedies obsolete. These new methods of treatment are, however, likely to be effective only in the bacterial infections of the outer eye. Intraocular inflammation is rarely bacterial, and such common conditions as iritis and choroiditis still need intensive study.

In reply to questions Professor Sorsby said it was doubtful whether the routine prophylactic use of silver had done much to reduce the incidence of ophthalmia neonatorum, nor did he think the sulphonamides likely to do so. Routine instillation of penicillin eye-drops at birth deserved extended trial when supplies permitted. The placenta was a powerful barrier to the transmission of intra-uterine infections and it remained uncertain which organisms could pass; much of what had been called intra-uterine inflammation was really genetic disease. There was nevertheless a considerable field

uch infections.

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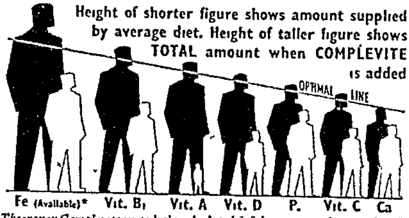

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48 revealed irreparable atrophic or obstinate lesions, not dependent upon any endocrine defect whatsoever. Their gonadotrophic treatment was waste of time and material.

Am.J.Med.Sci., **207**, 519 (*April* 1944). *A consulting-room technique for testicular biopsy is detailed in J. Mental Science*, 90, 681 (*July* 1944).

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THE LANCET

LONDON: SATURDAY, MARCH 31, 1945

The Negotiators Report

FROM the beginning of this year a Negotiating Committee representing the British Medical Association, the Royal Colleges, and other professional bodies has been meeting the Minister of Health and the Secretary of State for Scotland to discuss the Government's proposals for a National Health Service. The committee has now produced a report, which was discussed by the BMA council on March 21, and by the comitia of the Royal College of Physicians of London last Monday, and will be considered by the council of the Royal College of Surgeons of England at its next meeting on April 12. The BMA council will place the report, with their own recommendations, before a special representative meeting to be held in London from Thursday, May 3 onwards. The report itself is a confidential document in that it cannot be published. But the Association has arranged to post a copy to every member of the profession, and these are likely to be delivered over Easter.

Globulin in the Control of Measles

THE physicochemical researches on human plasma carried out by Professor COHN and his colleagues[1] at Harvard have culminated in discoveries of immediate practical application in medicine, and one of the p[illegible] in almost pure form— g[illegible] in tl[illegible] ses 3[illegible] be divisible into three sharply demarcated fractions—alpha globulin (13% of all plasma protein), beta globulin (14%), and gamma globulin (11%), originally called Cohn's fraction II, which appears to contain the main immune bodies in human blood. The latest preparations of gamma globulin have been concentrated to a degree approaching 98%, the main impurities being albumin and beta globulin; the final product represents a 25-fold concentration of the original plasma. Suitably buffered and stabilised this preparation can, without significant change, be heated at 57° C for 4 hours, whereby the agent of infective jaundice is destroyed. Although the solution is somewhat viscous and unsafe for intravenous administration, it is readily absorbed from muscle without untoward effect, local reactions being fewer than 5%. Its application in the prophylaxis and treatment of measles has lately been described in detail.[2]

Many of the inoculations for measles were made during the early experimental stages, when gamma globulin concentrations ranged from 75 to 85%; so there were considerable variations in dosage and therefore in the results obtained. But the latest preparations have proved to be more than twice as potent, volume for volume, as average pooled convalescent serum. The difficulties of assessing the efficacy of the prophylactic in humans, owing to the widely varying degrees of exposure and susceptibility of contacts, were largely overcome by large-scale trials in families, in schools, and in hospital wards. The optimum dosage finally arrived at was: for protection, 0·1 c.cm. per lb. body-weight given between the 3rd and 5th day after earliest known exposure, while for attenuation a quarter of that amount was considered adequate; proportionately larger doses were needed if inoculations were given later in the incubation period, and results then tended to be less constant. The attenuating dose appears to have been on the small side, compared with the protective dose, and indeed some of the descriptions given of successful attenuation approximate to what is usually regarded as normal mild measles in healthy subjects. Extensive experience of convalescent serum in this country, particularly in London,[3] has for many years fixed the optimal attenuating dose as half the protecting dose. In a more recent study, GREENBERG, FRANT, and RUBSTEIN[4] compared gamma globulin with placental extract; a fixed dosage of 2 c.cm. of the former and 5 c.cm. of the latter was adhered to regardless of age, given to household contacts aged 6 months to 6 years, between the 3rd and 8th day of exposure. The results clearly showed the superiority of gamma globulin, which gave 78·7% protected, 21·3% modified, and none unmodified; compared with 38·9% protected, 37·7% modified, and 23·3% unmodified with placental extract. In a control (uninoculated) group of 65 contacts of similar age 83% developed measles; 31% being severe, 12 moderate, and 10 mild (corresponding in character of attack to the serum-modified cases). The results in the 814 cases receiving globulin were examined at each age-group and they became steadily less favourable both in protection and attenuation as age increased. Adjustment of the dosage to the age or body-weight is particularly necessary in rural communities where chances of exposure and partial immunisation are remote; in urban communities results of serum prophylaxis always tend to be flattered by the fact that a significant proportion of the presumed susceptibles have already been partially or completely immunised by latent or unrecognised attack. The globulin was used in doses of 5 to 35 c.cm. in the treatment of fully developed measles in 30 patients whose ages ranged from 10 months to 34 years; in 13 some modification of the disease was recorded, based solely on clinical impressions. In a further 31 patients in the pre-eruptive stage, modification was observed in 24, while no rash ensued in 2, although Koplik spots and other features put the diagnosis beyond doubt. It is understood that gamma globulin, supplied through Professor COHN and the Committee on Medical Research, has already been used for measles prophylaxis in this country. Preliminary trials have largely confirmed the claims made for it, but dosage is not yet finally settled.

To what extent this new reagent will displace those widely used in the last two decades—convalescent and normal adult serum, and placental extract—is uncertain. It apparently obviates such risks as the homologous serum jaundice recorded with convalescent and adult serums, and indeed it has been used to prevent infectious jaundice in contacts.[5] It is probably also more stable, but nowadays desiccation of convalescent serum to powder form has overcome this particular difficulty. It is, moreover, seldom the cause of such reactions as are not uncommon with placental extract, from which a fatality has recently been reported.[6] But perhaps its greatest merit will be its increased range of application: provided it is prepared from sufficiently large pools the globulin is likely to contain protective antibodies to a number of communicable diseases such as whooping-cough, chickenpox, mumps, and poliomyelitis. But it is unlikely to influence significantly the character or course of epidemics unless a stable preparation of uniform potency is available in sufficient quantities to permit us to expose susceptibles deliberately to a particular infection in order to confer on them the lasting benefit of a modified attack; convalescent serums have been too uncertain to warrant this crucial test. In combination with active immunisation methods involving the use of attenuated virus[7] the hitherto constant menace of measles to the young should be reduced considerably if not eliminated.

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[1] Cohn, F. J. *Chem Rev* 1941, 28, 395.

[2] Cohn, F. J. et al *J. clin. Invest.* 1944, 23, 417.

[3] Gunn, W. Reports on Measles Epidemics by Medical Officer of Health, London County Council, for 1931-32, 1933-34, 1935-36, London.

[4] Greenberg, M., Frant, S., Rubstein, D. D. *J. Amer. med. Ass.* 1944, 126, 944.

Resettlement

IN our industrial society doctors are encouraged to prescribe appropriate drugs but are seldom enabled to prescribe appropriate work—which is often far more important. During the war the medical profession has won a better foothold in industry, through the development of industrial medical services; but, on the other hand, the demands of war have been held to justify employment of many people in work that may harm their health. When the war is over we must hope that medicine will do more to prevent people undertaking work for which they are unfit, and also more to find them the right occupation.

To find the right occupation for a patient left with residual disability after illness or injury is often extremely difficult. The work should be such as will fully utilise his remaining abilities, after any further training that may be necessary: and he must have a real opportunity to succeed in it. The Disabled Persons (Employment) Act, 1944, has been designed to help in providing work—and the right work. Among other things the Act will create a Register of Disabled Persons and will impose on each employer an obligation to carry a (variable) quota of disabled staff. It defines a disabled person as one who, on account of injury, disease, or congenital deformity, is substantially handicapped in obtaining or keeping employment, or in undertaking on his own account work of a kind which, apart from his handicap, would be suited to his age, experience, and qualifications. It is intended to confine the register to those likely to be capable of holding a job, and the disabled man must not unreasonably refuse to attend a course of vocational training or reablement, nor be of habitual bad character. Shortly before the Bill became an Act we expressed misgivings about the register and the quota, fearing lest "both employer and disabled will become 'cripple-minded'—the employer because he is forced to take labour which through ignorance he instinctively distrusts, and the employee because he knows he is a marked man, distrusted and resented by his employer."[1] We thought the emphasis should have been put on the ability of almost every disabled man to earn his living in the open labour market. The Act moreover permits an employer, following the letter but ignoring the spirit, to make up his quota entirely from the lightly disabled; and it is said that some are planning to get as many as possible of their present employees on to the register so that they will need to take no others. Such evasion of social responsibility must be resisted, and—whether or not the scheme is the best possible—all parties must unite to make it work. The appeal is not so much to sentiment as to economic sense. The potential value of the disabled to the community is illustrated by the latest figures from the United States where some 44,000 men and women were returned to employment last year by the Office of Vocational Rehabilitation. Their average earnings in the previous year had been $143, but after an expenditure of $147 on reabling them it rose at once to more than $1700.

Under the Act central and local advisory committees (with medical representation) will be set up to help the Minister of Labour and National Service in its administration. The question will arise, for instance, whether a person is suitable for admission to the register or should be removed from it, and the rightness of decisions will be important not only from the individual standpoint but in order to make the quota serve its purpose. What is most necessary, however, to make the scheme effective is genuine coöperation by the many people involved—the disabled man himself, the employers, the medical profession, and the Ministry of Labour and National Service. On another page Mr. WATSON-JONES urges the need for medicine to play its part. But if doctors have as a whole to take more interest in industrial health, the Ministry on its side must appreciate that medicine has a contribution to make in these matters, and must be willing to act on medical advice. To make the best use of the profession, family doctors must be given an opportunity to help in the resettlement of their disabled patients in work; and further there must be available to the Ministry and to general practitioners and hospital staffs the services of medical experts with real and substantial experience of industrial health—men thoroughly familiar with industrial stresses and the demands of particular occupations. As Professor FERGUSON points out at the front of this issue, only catastrophe can come of leaving the placement of the disabled to the unaided efforts of a local lay officer of the Ministry of Labour, even though he is armed with a medical dictionary and a list of occupations thought to be suited to particular disabilities.

Resettlement of the disabled essentially demands balanced consideration and expert help. It demands an individual approach and usually a measure of continuing supervision until the disabled man is securely lodged on work within his compass. Undertaken along these lines, and in a spirit of sympathetic understanding, it has great possibilities; and we must gain as much as we can from the Act. One of the objects of the new British Council of Rehabilitation, as announced in our issue of March 3, is "to secure the active coöperation and participation of commerce, industry, and professional bodies in the problems of resettlement," and in Mr. H. E. GRIFFITHS, chairman of its executive, the Council has a leader who has long preached that, for the worker, the criterion of recovery is restoration of capacity to *work*.

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[5] Stokes, J., Neefe, J. R. *Ibid*, 1945, **127**, 144.
[6] *Ibid* (answers to queries), 1944, **124**, 472.
[7] *Lancet*, 1944, i, 728.

[1] *Lancet*, 1943, ii, 771.

Orthoptics in Peace and War

Since CLAUD WORTH taught the three degrees of binocular vision and the use of the stereoscope, interest in squint training has grown apace. The British Orthoptic Society was formed in 1937, and some years before the war all the leading eye hospitals, and many general hospitals as well, had started orthoptic clinics. At these clinics qualified orthoptists worked under the guidance of ophthalmic surgeons, and endeavoured to teach squinting children to develop binocular vision. Sometimes also the latent squints of adults received attention, though they were less likely to benefit. It may be appropriate now to inquire into the results of orthoptic treatment and to ascertain what exactly can be done for the squinting child by this means.

Before the age of five, children do not coöperate well enough to allow of any squint training. Until they reach this age it is the duty of the ophthalmic surgeon to see that correct glasses are worn, and that by wise occlusion of the sound eye the squinting eye is not allowed to become amblyopic. When the child is old enough to coöperate, simple exercises can begin, and the whole purpose of these is to teach the child to use the two eyes together by fusing pictures seen through the stereoscope. If the squint is transitory, or very slight it is sometimes possible, when fusion has been taught, to train the eyes to the normal position, but in the great majority an operation is necessary: orthoptics by themselves are not a cure. Having taught the child to look down a stereoscope and fuse two pictures into one at the angle of squint, the eyes are then straightened by a muscle operation and the treatment is continued, with the final result of two straight eyes which work in unison. Eyes so treated will not again wander, and the patient has all the advantages that stereoscopic vision offers. This is the cure of a squinting eye, and it is achieved not by orthoptics alone or by operation alone, but by the two together. Orthoptic training is a great advance, for it leaves the patient with two straight and seeing eyes instead of with two eyes which, although straight, do not work together, and of which one is lazy. To achieve this end, however, a great deal of time and patience is necessary, not least on the part of the parents. Since the war it has often been inconvenient to bring children into London or large urban areas two or three times a week for this treatment to be carried out; but a great deal can be done in the home with hired apparatus, if the parents will give patient supervision.

Since the war a number of orthoptists have been employed in the Royal Air Force in treating flying personnel. At the outset much time was spent in developing a high degree of binocular vision in those who lacked it, in order that they might become pilots, but latterly this treatment has been less in evidence. If a would-be pilot is unable to fly without orthoptic exercises it is probable that when the stress and strain of aerial warfare begins to find out his weaknesses his binocular vision will break down again. There is an ample supply of potential pilots with good binocular vision, and while this is so it is better to make use of them than to spend time in giving others training, which may in the end prove to be wasted. Service orthoptists, nevertheless, have been very useful in rehabilitating the eyes of sick or injured airmen. Illness causes loss of the muscle tone on which perfect coöperation of the two eyes depends, and every convalescent reading in bed after a long illness knows what difficulties loss of ocular muscle tone entails. Head injuries especially are liable to upset binocular balance, and much good work has been done in restoring ocular muscle tone to those who have lost it for one or other of these reasons.

It is interesting to note that the permissible limits of heterophoria in the RAF are being gradually extended, and perhaps we shall find that orthophoric vision is not quite so important in the landing of aircraft as was at first thought. The first number of the *British Orthoptic Journal* was published just before the war and the second has lately appeared. Reading through its pages of tables and degrees of this and that one feels that there is a danger that those who practise orthoptics are relying too much on the readings of their machines and not allowing enough for the human element. It is refreshing to read Squadron-Leader DOGGART's reminder[1] that while such symptoms as headache, transient blurring of vision, intolerance to light, and pain on moving the eyes, may be due to ocular abnormalities, they are also the stock-in-trade of the anxious neurotic.

Annotations

ÆTIOLOGY OF GRANULOMA VENEREUM

THE venereal disease known here as granuloma venereum and in America as granuloma inguinale has long been recognised on clinical and pathological grounds as a distinct entity. It is essentially a disease of tropical climates, including India and the Southern USA, and its ulcerative lesions in groins and on the genitalia have earned it an unpleasant reputation. Though Donovan[2] discovered characteristic intracellular bodies in the lesions as long ago as 1905, and the association of these bodies with the disease has been amply confirmed, no organism recoverable by cultural methods has yet been accepted as the causal agent. A new chapter in the story opened with the employment by Anderson[3] of the yolk-sac of developing chick embryos as a culture medium for tissue fragments from biopsy specimens of the ulcers of a typical case. Further reports[4] from the same laboratory seem to establish the organism thus recovered on a firm ætiological basis. This organism, for which the name *Donovania granulomatis* is tentatively proposed, has now been recovered from three cases by the inoculation of biopsy material into the yolk-sac of chick embryos 5–9 days old. It grows intracellularly in the epithelial cells of the yolk-sac in the form of bipolar rods with well-defined capsule, indistinguishable from the Donovan bodies of the human lesion. Extracellular and also unencapsulated forms are seen and the latter assume [illegible] ety-pin" [illegible] s of this [illegible] thermo- [illegible] the yolk [illegible]

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[4] Anderson, K., De Monbreun, W. A., Goodpasture, E. W. *J. exp. Med.* 1945, 81, 25.

from embryonated eggs to which chick heart tissue is added enables growth to be obtained ultimately on agar slants down which embryonic yolk only is run. Embryonic yolk heated to 60° C for 30 minutes also supports growth, but heat-coagulated yolk is an inadequate medium. The failure to recover this fastidious organism by direct cultivation of human lesions on orthodox media is thus fully explained.

To confirm the suggested relationship of this new organism to the disease, Anderson and her co-workers carried out immunological studies.[5] Yolk cultures contained a mucoid substance thought to be derived from the capsules of the organism. This material could be purified and used in precipitin and complement-fixation reactions. Sera from cases of granuloma inguinale reacted with the mucoid antigen, whereas control sera failed to fix complement and only rarely gave precipitation. In addition to these in-vitro studies, skin tests carried out either with heated purified yolk-sac cultures or with purified capsular material indicated a specific reaction in patients with the disease but not in control subjects.

This study has an interest far beyond immediate ætiological considerations. The Donovan organism, though considered by the American workers to be a bacterium, appears to possess unusual growth requirements. Elucidation of the nature of the relatively heat-stable growth factors of the new organism may well have a bearing on the growth of other intracellular parasites, including perhaps the rickettsias. It seems fitting that this new venture should originate from workers in the laboratory which first employed that most useful culture medium, the developing hen's egg, in virus and bacterial studies.[6] They are now making chemotherapeutic studies in the test-tube with antimony compounds—a logical sequel to the known action of such compounds on human granuloma inguinale. Others will doubtless attempt the direct cultivation of the organism from the human lesions; the main difficulty appears to lie in separating it from the common bacteria of the human skin. The American workers avoided contamination by several methods, including utilisation of the Donovan organism's capacity for survival on ordinary media at 37° C for 2–4 days; uncontaminated tissue fragments can thus be readily distinguished and transferred from culture media to the chick embryo. The fact that the human disease is resistant to penicillin therapy[7] suggests that penicillin might be usefully employed in this difficult stage of initial recovery of the organism, unless it exhibits an unexpected in-vitro sensitivity to the drug.

MORE PENICILLIN

There will soon be enough penicillin in the country to treat every hospital patient suffering from any disease known to respond better to penicillin than other drugs. The biggest penicillin plant in the world, working on the American principle of deep fermentation, is now being erected at Speke, near Liverpool, and the Ministry of Health is shortly distributing supplies to 200 large hospitals, which will issue it to smaller hospitals and practitioners. Forecasts that in 2–3 months it will be on sale in chemists' shops have lately appeared, but the Ministry does not foresee early distribution through ordinary commercial channels. The period of short supplies, though it has produced hardship in individual cases and irritation among practitioners, has had the salutary effect of limiting penicillin therapy to hospitals where its administration can be carefully controlled and results fairly judged. In the United States penicillin has hitherto been distributed by a centre set up by the War Production Board in Chicago, and the centre has been sending out about 400,000 vials, each containing 100,000 units, every month to some 2700 hospitals. Now American producers may sell the drug through the wholesale chemists, and the monthly supply will be raised to 1,500,000 vials. Even so, there will not be enough to permit the general sale of pills, lozenges, ointments, and the like, containing penicillin. The Americans, like ourselves, must be hoping that the relaxation of control in distribution will not lead to uncontrolled medication. However plentiful supplies become, penicillin should be used in practice only for infections known to respond to it, and wherever possible the infecting bacteria should previously be tested for sensitivity. Exceptions to this last requirement are the prophylactic use of the drug before and after operation, illnesses that are clinically septicæmic where an infecting organism has not yet been isolated, and acute streptococcal and pneumococcal infections not responding to sulphonamides.

UPPER RESPIRATORY CLINIC FOR CHILDREN

Dissatisfied with the criteria for the removal of tonsils and adenoids in children and the investigation of their recurrent respiratory infections as a whole, the staff of the ear, nose and throat department of Willesden General Hospital decided to form a special clinic to go into these subjects. The child is an entirely different problem from the adult. In the child it should be possible to correct disability while it is in the stage of dysfunction and before it has reached an established pathological state. It was hard to keep this point of view when seeing children mixed up in a general clinic, and an ear, nose and throat clinic for children only was therefore started. In opening a discussion at the Royal Society of Medicine on March 2, Mr. F. C. W. Capps and his colleagues[1] explained that the clinic aimed at encouraging repeated attendances so as to avoid a quick decision at a single isolated consultation, to record progress, and to maintain a state of environmental defence. A scheme of investigation, starting with an assessment of social conditions and environment by the social welfare department, followed by clinical examination, radiography of the accessory sinuses, soft-tissue radiography to exclude an obstructive pad of adenoids, and screening of the chest, was laid down. Ideally the upper and lower respiratory tracts should be considered as a whole, and to this end it was intended to have a pædiatrician associated with and probably controlling the activities of the clinic. Owing to war-time shortage of staff this has not been possible, and a rhinologist with past experience of general medicine has been in control. Special attention has been paid to the evolution of the mouth breather, particularly those in whom operations for the removal of enlarged tonsils and adenoids has been a total or partial therapeutic failure. Normal nasal respiration depends on the efficiency of a series of muscle-group activities, starting with the maintenance of facial symmetry and dilatation of nasal alæ, followed by closure of the isthmus of the fauces by interaction of the tongue and palatal musculature, and finally recurrent and rhythmical deglutition to remove secretion and debris from the postnasal space. It was realised that such musculature must have a properly orientated scaffolding on and from which to work. This postulated a normal craniomandibular relationship, and to assess this factor an orthodontist was included in the team. The functional evaluation of coördination and control of the palatolingual and respiratory musculature was deputed to the speech therapist.

The aim throughout has been to restore conditions for a normal respiratory exchange and deglutition by reconstituting a normal bony structure of the jaws; removing obstructive or diseased lymphoid tissue which will not respond to environmental and conservative therapeusis; clearing occluded areas in the nose and accessory sinuses by conservative measures where possible but by lavage or even operation in persistent occlusion or chronic infection; and finally restoring the activities and tone of the various muscle-groups concerned. At the same time the child's general health and posture have been under constant supervision.

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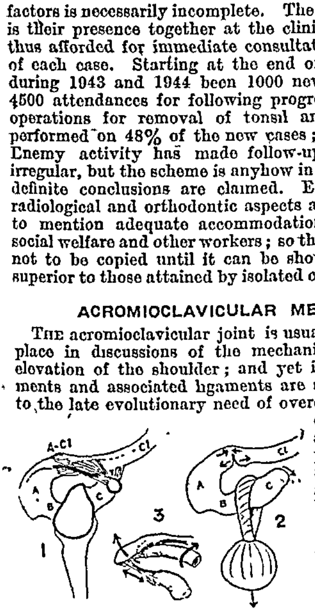
[5] Anderson, K., Goodpasture, E. W., De Monbreun, W. A. *Ibid*, p. 41.
R. A. *Amer. J. Syph.* 1944, 28, 611.
A. M., Goodpasture, E. W. *Amer. J. Path.* 1931, 7, 209.

[1] Mr. E. Gwynne-Evans, Mr. Arnold Nove, and Miss J. H. Van Thal.

The team has so far consisted of social worker, rhinologist, orthodontist, and speech therapist, and close coöperation has been demanded from the radiological department. There is scope for much more social welfare investigation than has been possible in war years and the incorporation of a pædiatrician is an urgent requirement. Without him the assessment of the lower respiratory factors is necessarily incomplete. The virtue of the team is their presence together at the clinic and the facility thus afforded for immediate consultation on any aspect of each case. Starting at the end of 1942 there have during 1943 and 1944 been 1000 new cases and some 4500 attendances for following progress. During 1943 operations for removal of tonsil and adenoids were performed on 48% of the new cases; in 1944 on 36%. Enemy activity has made follow-up and attendance irregular, but the scheme is anyhow in its infancy and no definite conclusions are claimed. Expenses from the radiological and orthodontic aspects alone are high, not to mention adequate accommodation, and salaries of social welfare and other workers; so this is an experiment not to be copied until it can be shown to give results superior to those attained by isolated consultative clinics.

ACROMIOCLAVICULAR MECHANICS

THE acromioclavicular joint is usually given a minor place in discussions of the mechanism of abduction-elevation of the shoulder; and yet its complex movements and associated ligaments are specifically related to the late evolutionary need of overcoming the weight of the suspended arm. MacConaill[1] points out that in abduction there is an increasing angle between clavicle and acromion, and an increasing gap between the root of the coracoid and the overlying clavicle. The latter separation tightens the coracoclavicular ligament, and, since its conoid portion is attached to the posterior border of the clavicle, the clavicle is rotated backwards on its long axis and screwed home at the acromioclavicular joint. This joint, lax at rest, is now welded together after the first 20° of abduction, scapula and clavicle moving as one for the rest of the arc.



1. Acromioclavicular joint (A–Cl) and related parts from glenoid cavity. A, acromion process; B, base of spine of scapula; C, root of coracoid process; Cl, clavicle.
2. Mechanical scheme of joint under breaking stress by vertical load.
3. Showing how relative rotation of scapula and clavicle tends to bend acromion process upwards.

If the essential part of the shoulder-girdle is regarded as a hook, with the arm suspended from its crook (see figure), it is obvious that the limb tends to drag the coracoid away from the clavicle, to separate forcibly the lower part of the acromioclavicular joint, and to crush together its upper surfaces. The tension strain is met by the coracoclavicular ligament; and the compression across the upper half of the joint by the intra-articular disc which only needs to occupy this part, is much thicker above, and has its free thin lower edge at the point where compression ceases to act.

These views also account for the presence of the strong coracoacromial ligament, whose fibres are arranged as if against a strain tending to separate its attachments, although they are both part of the scapula, and not at all according to its conventional function of a secondary socket for the head of the humerus. MacConaill shows that, in fact, there must be such a strain, since the screwing back of the clavicle in abduction tends to bend the acromion upwards, a movement actually occurring in the occasional cases with an acromiospinous joint; in any case there is a constant strain during the period of ossification. The ligament develops against this need, and is also accessory to the acromioclavicular joint, which can thus be more lax and mobile than it could be if
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base held to the rotating clavicle by the conoid and trapezoid ligament, its apex to the acromion under tensile strain resisted by the coracoacromial ligament. It is not surprising therefore that it should be small or absent in mammals with much less independent shoulder range. And the arrangement is mechanically sound. The mechanical disadvantage in abduction is greatest between 20° and 90°; and the best cooperation of muscles moving the scapula with those moving the humerus is obtained by the locking of clavicle and scapula beyond the arc of 20°, when the normal swing of the hanging arm changes to powerful abduction.

PAPWORTH SURVEYED

Two questions commonly put to the doctor in charge by patients with tuberculosis—are my children specially susceptible to infection? will they run an extra risk of catching the disease from me?—are neither of them easy to answer. Infective contact (in Lyle Cummins's phrase) in the home is presumably the most important factor in the production of cases; but may not the added care given to the child's upbringing more than offset the added risk of infection? Help in answering may be expected from observations made in an institution under medical control, and Brieger has provided a masterly survey for the Papworth Settlement.[1] Of the 108 children born in the colony (apart from those of healthy staff) during the period 1922–38 none died of tuberculosis; there were a few stillbirths, some fatal accidents, and 1 death from diphtheria; otherwise the general childhood mortality was negligible. Just over
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sately survived the critical first years of life. But when the survey closed in 1938 their average age was only 5 years;
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to occur.
future to reveal; MacNalty in his preface thinks it "not improbable" that their resistance to disease may continue through life. Their record indeed compares favourably with that of the other groups analysed—healthy staff and children born before admission. These are remarkable results, as MacNalty puts it, achieved by following Varrier-Jones's maxim "To prevent disease it is necessary to create an environment," of which the essentials are good feeding and avoidance of massive doses of infection. There is nothing peculiar to Papworth about the maxim or its application except the founder's flash of intuition, the fervour he transmitted to his staff, the slogging of L. B. Stott who kept the case-notes and a chronicle of all the major events in the lives

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[1] MacConaill, M. A. *Proc. R. Irish Acad.* 1944, 50, 159.

[1] The Papworth Families. E. M. Brieger, MD BRESLAU, member of Papworth research staff, with a preface by Sir Arthur MacNalty, formerly CMO, Ministry of Health. Heinemann. Pp. 674. 45s.

of the village community, and the versatility of the investigator who learned his fundamentals as head of the tuberculosis colony at Bieslau and whose thoughts range far and wide over every aspect of the field. The production of the book, no mean achievement in itself, is the work of Papworth Industries under the direction of Peter Fraser.

INCIDENCE OF TRENCH FOOT

On the Italian front the United States Fifth Army reports a gratifying reduction in the incidence of trench foot, even though the fighting has moved north to colder parts and the troops have often been immobilised in mud under driving rain, sleet, or snow in sub-freezing temperatures. During January, 1944, when the battle lines were near Cassino, the Fifth Army had 1490 cases of trench foot; this January there have been only 223. In the four months, November, 1943, to March, 1944, 23% of the army's total casualties were the result of trench foot; in the period from October, 1944, to February, 1945, the proportion had fallen to 8%, and the cases amounted to only 1·3% of the total infantry strength, compared with 4% a year before. The improvement is ascribed partly to better boots, but more to stricter discipline and unit responsibility for carrying out preventive measures.

A VASCULAR SPHINCTER

In the fœtus two streams of blood reach the heart, from the superior and inferior venæ cavæ; and two views have been held about their behaviour. Some have believed that they mix; others that they cross one another in the right auricle, the superior caval stream proceeding to the right ventricle, and reaching the dorsal aorta by the ductus arteriosus, whereas the inferior caval stream passes through the foramen ovale to the left auricle and so to the left ventricle and aortic arch. The latter view presented the attraction that, since the inferior caval blood came largely from the placenta, the flow richest in oxygen was diverted to the head and the coronary vessels. The other view represented a revolt against it because of the apparent improbability of the two streams not getting more or less completely mixed in the right auricle.

In a book[1] just published, Barclay, Franklin, and Prichard settle this issue with a degree of finality rather rare in physiological discussions. The jumping-off point was an investigation into the time of closure of the ductus arteriosus. This was an ideal problem for solution by means of the cine-X-ray camera devised by Barclay—the only instrument in this country, and one of the very few in any country, capable of taking direct photographs. For purposes of this research Barclay stepped the speed of the camera up to three exposures a second. With the fœtus delivered, but the placental circulation intact, records of the circulation in the fœtal chest were obtained, and they are beautifully reproduced in the book. They showed that the ductus arteriosus was a sphincter and closed physiologically within 4–10 min. of ligating the cord. It appeared also that the superior caval stream did go to the right ventricle, while most, but not all, of the inferior caval stream found its way to the left auricle. This finding raised again the vexed issue of the crossing of the streams. The authors, in a new survey not only of the anatomical history but of the anatomy itself, remove the difficulty: the superior caval stream is conducted directly to the right atrium; while the inferior caval stream, on reaching the heart, breaks on a projecting ridge of tissue and is largely diverted *into a funnel formed on one side by the* wall of the septum and on the other by the so-called valve of the foramen ovale.

The study is completed by an investigation of the vessels leading to the fœtal heart, and a satisfactory account of the ductus venosus is given.

FRS

The list of new fellows of the Royal Society, printed in our news column, contains two medical names. Dr. Leonard Colebrook, of the Medical Research Council staff, has studied chemotherapy as a bacteriologist of the St. Mary's school. He was one of the first in this country to examine, in 1936, the antibacterial action of sulphonamides, on which he writes again in our columns this week. Appointed an Army consultant in pathology at the beginning of the war, he has since taken a large share in the work of the burns units at Glasgow and more recently at Birmingham. Dr. J. H. Gaddum, professor of materia medica at Edinburgh, previously held chairs of pharmacology at Cairo, at University College, London, and at the College of the Pharmaceutical Society. He worked with Professor C. R. Harington on thyroxine, and with Sir Henry Dale on the liberation of acetylcholine at nerve-endings, and he has written on the physiological behaviour of vasodilator substances as well as the biological standardisation of neoarsphenamine. Prof. H. D. Kay, director of the National Institute for Research in Dairying, held a Beit medical fellowship and was at one time biochemist to the London Hospital. Mr. J. Z. Young, lecturer in zoology at Oxford, has been in close touch with medicine during the war as one of the Oxford team investigating regeneration of nerves. The only woman previously elected to the fellowship was Queen Victoria; and we are glad to note that two women are named among this year's fellows, one of whom, Miss Marjory Stephenson, is an authority on bacterial metabolism and a member of the scientific staff of the Medical Research Council.

TOMORROW'S BREAD

The Ministry of Food, in collaboration with the Ministry of Health, has arranged a conference with industrial and trade organisations to advise the Ministers on future policy for flour and bread and on any regulations that may have to be made after war-time control ends. The milling and baking industries, the flour-milling trade, and the Coöperative Movement have been asked to nominate representatives. Sir Henry French, permanent secretary of the Ministry of Food, will preside, and the conference will be attended by Lord Horder, personal adviser to the Minister of Food on medical aspects of food problems, Sir Jack Drummond, FRS, the Ministry's scientific adviser, Sir Wilson Jameson, chief medical officer of the Ministry of Health, Dr. Andrew Davidson, chief medical officer of the Department of Health for Scotland, and Sir Edward Mellanby, FRS, secretary of the Medical Research Council.

The Royal College of Physicians of London, in comitia on Monday last, re-elected Lord MORAN to be their president for a further year.

Dr. HENRY MACCORMAC will deliver the Lumleian lectures at the Royal College of Physicians of London on Tuesday and Thursday, April 17 and 19, at 4.30 PM. He has chosen as his subject Prospect and Retrospect.

PENICILLIN-PHENOXETOL CREAM.—Several air-borne organisms, and particularly *Ps. pyocyanea*, produce a penicillinase which decomposes penicillin. Thus an infected penicillin cream may rapidly lose its potency and act as an infective agent. In the annual report of research done at the College of the Pharmaceutical Society, Prof. H. Berry says that a penicillin cream containing 2% of phenoxetol will keep sterile during its use in the wards, besides being effective against *Ps. pyocyanea* in wounds.

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[1] The Fœtal Circulation and Cardiovascular System. By A. E. Barclay, OBE, DM, FRCP, FFR, K. J. Franklin DM, FRCP, M. M. L. u, MA, all of the Nuffield Institute for Medical Re- Oxford. Blackwell. Pp. 275. 50s.

Special Articles

DISABLEMENT AND EMPLOYMENT

R. WATSON-JONES, M CH ORTH. LPOOL, F R C S
DIRECTOR, ORTHOPÆDIC AND ACCIDENT SERVICE, LONDON HOSPITAL; CONSULTANT IN ORTHOPÆDIC SURGERY, ROYAL AIR FORCE

A DISABLED man, despite his disability, should be an asset and not a burden. When treatment is completed it is our duty to consider his ability rather than his disability. His handicap can be minimised. He can be trained and employed in almost every type of industrial and professional activity. The success with which this is achieved is one of the standards by which the civilisation of a country may be judged. On the one hand, a cripple may be a social outcast dependent upon alms; on the other, he may be restored to useful employment and full citizenship.

Much has been done in this country; but much remains to be done, and in many respects we have failed. In former years when disability resulted from war service, and the community felt an obligation to repay its debt, employers appointed unwanted commissionaires and superfluous lift-attendants. But there can be no greater degradation than to engage a man on duty which he knows to be unimportant, unnecessary, and specially prepared as a concession. The compassionate approach is misplaced; the charitable creation of artificial jobs is misguided. Moreover when disability was due to the hazards of industry, and the debt of the community was less clearly recognised, we often added to the insult of degradation the injury of financial hardship. We were content to award compensation by the payment of a few shillings each week, or to dismiss the matter once and for all by the payment of a sum in final settlement.

WHAT HAS TO BE DONE

In recent years it has been recognised more and more fully that the treatment of physical disability is not a simple problem of surgical intervention. Good surgery and good medicine may be of primary importance; but equally important are those measures of active exercise, massage, gymnastics, occupational therapy, and recreational treatment which have become known as medical rehabilitation; and of no less importance are the social services of vocational retraining and resettlement in the life of the community, which alone complete the treatment of disability. These three phases—medical treatment, rehabilitation, and resettlement—are of equal significance; and if the problems of the disabled are to be solved they must be closely coördinated.

The necessary coordination has been achieved in the orthopædic service of the Royal Air Force. The airman with multiple injuries who is treated in hospital is transferred direct to a rehabilitation centre; if necessary he is readmitted to hospital for further surgery; he is transferred once more to the rehabilitation centre where treatment is completed in the gymnasiums and playing-fields; he attends refresher courses in his former trade; if the disability is permanent he is reassessed while still in the rehabilitation centre, and arrangements are made for retraining in a new trade; if medical problems arise during retraining he goes back once more to the rehabilitation centre or to the hospital. There is absolute continuity of supervision; there is no break in the sequence; there is close coordination of surgical treatment, rehabilitation, and industrial resettlement.

That which has been achieved in one military service, and is now being attempted by the Miners' Welfare Commission in the civilian service of coalmining, and by the Birmingham Accident Hospital in the industries of that city, must be achieved in the country as a whole. Every disabled person must be treated, rehabilitated, and resettled with no interruption and no break in continuity. The surgeon who accepts responsibility for one part of the treatment must accept responsibility for the whole of it. It is no defence to urge that he is untrained as a social service worker and has no contact with industry; he might as reasonably take no part in rehabilitation because he is untrained as a masseuse, or be unwilling to perform an operation because he is untrained as an instrument-maker. He must organise surgical treatment with a team of nurses and assistants, rehabilitation with a team of physiotherapists and gymnasts, and resettlement with a team of almoners and disablement rehabilitation officers.

WHAT IS BEING DONE

The Government has given an inspiring lead in this task. It has placed upon the statute-book the Disabled Persons Employment Act. It is true that the exigencies of war made it necessary to enlist the full man-power of the nation, and that utilisation of the services of the disabled was thus encouraged. [illegible] tion in the Government to cre[illegible] employment of the disabled, not [illegible] peril but because the disabled are capable and worthy of employment; there is a determination to ensure that Britain shall undertake pioneer work in rehabilitating those who suffer "a handicap in obtaining or keeping employment." An advisory council has been appointed to assist in implementing the Act, a council which includes not only employers but workers, not only doctors but disabled, a council which is already at [illegible]

out the country whose duty it is to interview patients while still under treatment. They are willing and anxious to assist as soon as it is known that the disability will be permanent and that retraining may be necessary. But they cannot succeed without the sympathetic aid of medical men, and of this they are still urgently in need.

The Ministries concerned are faced with great problems. Every voluntary association which can aid in the vast [illegible]

some measure of common training; it is promoting the [illegible] *it is coördina-* [illegible] e crippled, the blind and the deaf. In the words of Lord Rushcliffe, chairman of the council: "the primary aims are to bring together workers in every field of rehabilitation . . . to become a source of information and guidance . . . to organise short-term courses of study . . . and to promote research into problems arising, more particularly those which concern the economic outlook of the permanently disabled."

"Confidence and hope do more good than physic": thus wrote Galen two centuries ago. The words apply no less forcibly today. In relieving the handicap of the disabled person our task is to complete his treatment, c[illegible] r[illegible] I[illegible] are in the future. We must re-establish for him normal family life, normal employment, and normal recreation, and reinstate him in the privileges and duties of citizenship.

WOMEN MEDICAL OFFICERS IN UNITED STATES ARMY.—The office of the Surgeon-General at Washington states that 74 women medical officers are serving in the Army, of whom 4 are majors, 36 captains, and 34 first lieutenants, and 17 are serving overseas.

HOUSING

THE Government estimate that some three-quarters of a million houses are needed if every family is to have a separate dwelling after the war. The objectives are to provide these houses, to clear slums and overcrowded areas, and to improve housing standards by a continuous programme of new building which will take account of any increase in the number of separate families, needs arising from redistribution of population, and replacement of ageing houses. These aims are beset with great difficulties, but the Minister of Reconstruction's white-paper[1] outlines a campaign for overcoming them. We give the main points.

THE EMERGENCY PERIOD

The first two years after the German war will be regarded as a period of emergency, in which the aim will be to produce the largest possible number of separate dwellings.

Increase in Building Labour Force.—Before the war there were about 1,000,000 men in the building trades. The number employed on building work at home has since shrunk to 337,000. By normal and special releases from the Forces, by training apprentices, and by a special scheme of adult training it is hoped to increase the building labour force to 800,000 by the end of the first year, and thereafter to raise it to, and beyond, the pre-war total.

Housing will have the highest priority among civil work, but the building force will also have to contribute to building for war purposes (until the defeat of Japan), building for the export trade and essential civil requirements, the rebuilding of bombed premises, and essential repairs and maintenance.

Every effort will be made to use available resources to the best advantage by the use of new methods of construction which economise in labour, by standardising, and by the use of labour and industrial capacity normally outside the building industry. A special survey is being made by the War Damage Commission of seriously damaged, unoccupiable houses, with a view to framing a programme of repair.

Permanent Houses.—The maximum target which the Government feel they can properly adopt is one of 300,000 permanent houses built or building by the end of the second year. Of this total of 300,000 there would be about 220,000 completed houses at the end of the second year, and 80,000 in varying stages of erection. If more houses can be built they will be built. Prefabrication and other non-traditional forms of construction, which make a smaller call on building labour than the traditional methods, will be used as fully as possible in the construction of permanent houses during the emergency period while building labour is scarce. Firms and local authorities are now being invited to coöperate in the erection of experimental houses, in groups of 50 or more, employing various non-traditional methods of construction. The most promising of these types will be put into large-scale production.

Local housing authorities will be encouraged to divide a proportion of the permanent houses of all types, constructed during the emergency period, into two temporarily separate dwellings (commonly known as "Duplex" flats). The programme will also include conversion of large houses and hostels into flats, and the reinstatement of derequisitioned houses which would not otherwise be fit for reoccupation as dwellings.

Temporary Houses.—The Government have been authorised to spend up to £150,000,000 on the provision of temporary houses. Temporary houses are costly because of their short lives, and they are sub-standard in terms of accommodation, though not in equipment; but they will help to bridge the gap between the programme of permanent house construction and housing needs.

The early experimental work on temporary houses was carried out in terms of a pressed-steel house, on the assumption that the manufacturing capacity would become available for this work by the end of 1944. Changes in the munitions programme postponed the date, but the Government decided in September, 1944, that a start should be made, using such materials as wood, concrete, and asbestos cement; and production is proceeding with a number of ...

The United States government have agreed to send some 30,000 temporary houses on lend-lease terms for erection in areas of war damage, most of them to be delivered by the end of this year.

The production of temporary houses will continue long enough to meet the 145,000 allocations already made to local authorities. Production, transport, and erection of temporary houses will be undertaken by the Government on sites acquired and prepared by the local authorities, and the houses will be let and managed by the local authorities in the same way as permanent houses provided by them. Materials and fitments will be standardised as far as possible, and (as the war permits), manufacturers will be able to put these standard articles into production without waiting for specific orders.

In order to check any serious rise in building costs the Government will control the volume of contracts let by local authorities, the building and repair work done on private account, and the price of materials, standard components, and fitments. They also propose to provide subsidies for house-building both by local authorities and by private enterprise. In England and Wales they will give a subsidy in respect of privately constructed houses about the same size as those to be built by local authorities.

PRELIMINARY WORK

Over 1,500,000 of the houses damaged before the flying-bomb attacks required extensive repair, and by the middle of June, 1944, these repairs had been completed in all but 200,000 houses, many of the remainder not being worth repairing. The flying bomb created a special problem in Greater London, and efforts have been concentrated on repairing the maximum number of houses during the winter up to the minimum tolerable standard. The "winter target" of repair to 719,000 houses should now be complete.

New Construction.—In August, 1944, local authorities were invited to apply for allocations of temporary houses.

The initial allocations, made in November, 1944, amount to 86,520 in England and Wales and 33,195 in Scotland. Further allocations have since been made, and the total now amounts to 110,977 in England and Wales and 34,375 in Scotland.

The land now held by local authorities in England and Wales for permanent houses is 25,000 acres, sufficient for 250,000 houses. A further 32,000 acres (for 320,000 houses) are in process of acquisition. In addition, the Ministry of Agriculture have agreed that further sites totalling another 36,000 acres (for 360,000 houses) may be used for housing if required. In Scotland local authorities now hold 6000 acres, sufficient for 55,000 houses. A further 4000 acres are in process of acquisition. Sites for about 55,000 temporary houses have been approved in England and 28,000 acquired. The corresponding figures in Scotland are 15,000 and 8000.

Preparation of sites for permanent houses by the construction of roads and sewers is proceeding. Accepted tenders cover sites sufficient for 45,000 houses in England and Wales and 10,700 in Scotland. Detailed lay-out plans for permanent houses have been prepared for approximately 90,000 houses in England and Wales and lay-outs covering 78,000 houses have been approved. In Scotland lay-outs have been prepared for 28,000 houses, of which 23,800 have been approved.

CURRENT OPINION ON THE WHITE-PAPER

The change from pressed-steel to other types of prefabricated houses has not passed uncriticised. It is now clear that there will not be sufficient pressed steel available for this purpose before 1946, and the *Times* of March 15 comments that the new types of prefabricated house which the white-paper proposes have the same dimensions and suffer from the same siting disadvantages as the Portal house which they supersede: that is, they each need more land than a small permanent house, and they cannot be converted into permanent dwellings later. They also take some time to build; Mr. Duncan Sandys, the Minister of Works, has stated that only 3 of them, as against 10 Portal bungalows, can be put up with the building labour required for one permanent house; a *Times* correspondent (March 22) takes an even darker view: he estimates that a single bungalow requires, in all, some 1460 man-hours of traditional building labour as against a maximum of 1000 man-hours for the complete erection of a permanent house.

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[1] Housing, 1945. Cmd. 6609. HMSO. 2*d*.

A report from a committee of the Royal Institute of British Architects anticipates no lack of cement, roof tiles and felt, asphalt roofing, sanitary fittings, cookers, plumbing units, pipes and taps, or structural steel, but
has gra
round.
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which
establi
activities of regional housing councils throughout the country.

In England Now

A Running Commentary by Peripatetic Correspondents

WE who have served abroad are, it seems, "mal-
fice and
who are
ote from
with this
l since I
ng when
one feels fit and well and happy to find oneself regarded as psychopathic. I see the point, of course: there are more of them than there are of us, and the majority must be right and the minority queer.

But this "maladjustment" business is in danger of being overdone. War is much easier to bear overseas
times of peace. So the returned man finds his friends
he has known for years. If, off his guard, he forgets
tiredness is no crime, nor does it irritate: self-pity does.

But these are doubtless the maunderings of a returned psychopath who is taking time to settle down.

* * *

All this talk about equality of ex-Service men with civilians, whether in the matter of the chair of psychiatry or any other job, makes me and many others furious. Equality! Measured from what date? As Coventry Patmore might have written:

feet,
spent
in prison cage or tent,
his tests by strain and shot
so readily forgot,
then brotherly, not less
than they who for their very life would pay,
we'll *keep* our seats and say,
Thou must have pity on our selfishness.

Surely they who have suffered most must have every preference, not as a consolation prize, but because, other things being equal, in that they have endured they are the better.

* * *

Recent peripatetics have recounted their experiences as examiners for the MB, and have suggested that clinical nous is expected but academic abstractions are offered. The candidate might be in a better position if he could study the outlook of his future patients, and I have therefore set out below the *Students' Guide to the Layman's Idea of Medicine.*

Dermatology.—Do not waste time learning this. Skin rashes and disorders are curable: incurable as 2 : 1. Out of 3 "skins," therefore, 2 patients will accuse you (behind your
certainly lose your patient, however correct your diagnosis or skilful your treatment. That blessed word "Dermatitis" will never get past the Society's agent, who will come round and wave his little book at you, and refuse to pay out sick benefit to your patient. Dermatology is therefore a superfluous study.

Pathology.—Do not waste time learning this. Apart from the two classical malpraxes of (1) driving the rash in, (2) not driving the shock out, the following are the causes of everything:

1. *Injury:* (*a*) At work, going to work, or coming from work,
to "compensation";
anyone apparently
rist is fair game)
(*c*) caused by the fault of the doctor or the nurse (this really means "we are such perfect people that we could not
—the nurse
was
the doctor
was
2. *Neglect:* If you, or the nurse, or anyone else who can possibly be blamed, slandered, or sued, having read Cause 1, refrain from action for fear of litigation, you will be just as much blamed for "neglect." A sort of "Morton's Fork."
3. *Bad drainage:* In particular, bad smells.
4. "*Shock*": There is only one sort of shock: emotional shock.
5. *Age:* Magic changes occur at 7, 14, 21, &c.

Pathology is therefore a superfluous subject.

Neurology.—Do not waste time learning this. All lesions of CNS are due to (1) "Nerves" or "It's me noives"; or (2) "Paralysis." The cure of (1) is a permanent holiday with pay, and of (2) is massage, or preferably electricity. Neurology is therefore superfluous.

Mental Deficiency and the School Medical Service (Special Schools).—If you ever do any of this work, you will find parents always raise the defence of "we don't want our child to get like those children at the special school." The more hopeless the child, the louder the cry. Mutatis mutandis, the same arguments apply to any attempt to persuade people to enter sanatoria, &c. The public health service is really superfluous—all that is wanted is sweet drains and palatable food, and regularly emptied dustbins. The study of Public Health is therefore superfluous, apart from sanitation.

lies with us for misleading them. In addition to the study of
superfluous, the student
dge of (1) certification,
outpatient departments,
treatment.

Years ago my brother did my locum and summed it all up thus:

"Will you give me a sustifickit to go upon the Panel,
A description for some wadding and a little bit of flannel!"

Finally, remember it is your father's privilege to impoverish himself for years, and yours to spend your youth in study, to qualify as a pre-tuberculous houseman, in order to serve as a despised assistant, before loading yourself with debt, to buy a practice in a house that will warp your bride's outlook on life, so that ultimately some ignorant woman (or man) will reject you as the doctor to whom she intends to owe her bill, not because she can assess your merits but because "she heard you weren't married" or some other damn-fool reason.

THE KING has given directions for the appointment of Dr. L. A. P. Slinger to the executive council of the Island of St. Lucia.

Letters to the Editor

THE STATE AND THE CHILD

SIR,—One of the bitterest aspects of war is the relentless way in which it deprives thousands of children of their normal expectation of comfort and happiness. For the lucky ones it may be only a change of school, or less jam for tea; but upon others the breaking up of a home, the separation of parents, "shelter life," evacuation, terror, even death, have borne down with what result we shall spend the next fifty years in deciding. One can hardly pick up a newspaper without seeing bombed children in China, hungry children in India, and refugee children in Europe, gazing forlornly in passive despair at what the world is doing to them. In this country we have been spared many of these war-time evils; but we have still to contend with a system whereby children can be so badly treated in their own home that it is considered to be in their interest to remove them to another, where their fate can be even worse.

But at least it can be said that at last England is aware that all is not well, and a public inquiry into conditions, not only in remand homes but in all residential homes for children, will seek to put before the public exactly what is the position of children whom the State has to bring up as well as educate. Recent court cases present many disquieting features. It appears that the magistrates who protested against the conditions in a London remand home "exceeded their duties." Honest anger generally does exceed its duties, and those of us who have been making persistent but orderly protests for years well know the complacent indifference of public authorities. How many people have any idea of how dependent children are cared for in their own town or borough, although it is *their* rates and *their* taxes which actually foot the bill?

The public are at present indignant and sceptical as to whether the best is really being achieved. It is the "official" attitude that is so disquieting, because it seems able to ignore what might be called the human aspects of the case. A child dies, and it appears that he was beaten within a few days of his death. A little girl is neglected, and she is put in a remand home where she might have come to a different kind of harm. The law must decide who was responsible and punish them. From the human angle this matters less than that an official body should be unaware of the risks it was taking in the performance of one of its normal duties—i.e., that of caring for dependent children.

How inept to rely on any system of inspection of "Homes"! How many inspectors succeed in really knowing the children in the homes they inspect, and how many of the children come within measurable distance of knowing the inspectors? And in comparison with that confidence which is born of a real personal knowledge, how little it matters whether the sheets are clean or the lavatories well ventilated. We shall not mend matters with more and better inspectors, more and better homes; we need, first and foremost, a clear realisation that every child has the right to the sort of care that he would receive in normal circumstances in his own home from his own parents. That is his due, and he doesn't have to deserve it.

Then we must realise that if he is deprived of this, it will be a difficult job for any body of men and women, however well trained and however selflessly dedicated to their work, to provide a substitute. Therefore the men and women who are going to be foster parents, or house-mothers and teachers in residential schools, must be carefully chosen, and reasonably paid, so that their salaries compare favourably with those in other branches of the education service, and they must be properly trained in the understanding of the child's way of thinking and feeling.

A long way second comes the need for buildings which will adapt readily as homes for children. Such buildings must be workable, and they must look like a home and not a Home.

This is not asking a great deal, and now is the time whe[illegible]lic interest is aroused and ready to be harnessed.

E. MILDRED CREAK.

IRON OXIDE AND THE LUNGS

SIR,—The article by McLaughlin, Grout, Barrie, and Harding (March 17) is of great interest to those of us who see workers, such as arc welders, exposed to iron fume or dust. I would suggest that the trade of shot-blasting might offer a further useful field for exploration on these lines.

Although iron oxide dust may or may not be harmless and may produce X-ray changes of no serious significance, it may (as your leading article suggests) take a generation to be sure of this point. In the meantime it is necessary to insist on the wise provision of sect. 47 of the Factories Act. This states that persons must be protected against the inhalation of dust, whether this dust be injurious or offensive or of any substantial quantity. I cannot believe that the inhalation of dusts over years—dusts which colour the sputum—can always be altogether innocuous. The amount of chronic bronchitis in large industrial centres is considerable, whether this is due to murky cities and their smoke, poor housing, working conditions, or even stuffy pubs.

In 1902 Hall, also working in Sheffield, and also dealing with crocus and rouge used in polishing of silver, noted cases of dermatitis from these substances. What irritates the skin may irritate the mucous membranes, although I agree that in many dermatitis cases the element of friction is present which would not apply to the mucous membranes.

Oxford. G. P. B. WHITWELL.

BACTERIOLOGY OF ACUTE DIARRHŒA

SIR,—In the last twelve months there has been a very large increase in the number of cases of acute diarrhœa, of varying severity, with the one common factor that pathological laboratories are unable to isolate any responsible organisms. The choice of laboratory seems quite irrelevant. I have observed this many times in recurrent cases and family infections, as well as in isolated cases, and colleagues of mine have noticed the same. I am writing to ask whether any other clinicians or pathologists have had cause to wonder at the high percentage of negative stool cultures, and whether they can suggest the reasons. I should add that in my own practice stool specimens are at once delivered to laboratories by hand.

Edgware, Middlesex. F. HARWOOD STEVENSON.

*** The age-distribution of these bacteriologically negative cases of acute diarrhœa is not given. No specific ætiological agent has yet been found for the gastro-enteritis of infancy which nowadays has no particular seasonal prevalence. In other children and adults the most common causes of acute enteritis are the dysentery bacilli, particularly the Sonne variant which is now endemic in this country, and the salmonella food-poisoning organisms. Infections due to these two groups of organism seem to be on the increase, but isolation of the pathogen from the fæces may fail if modern selective culture media are not used. Staphylococcal food-poisoning and protozoan infections should be remembered, and there may well be intestinal infections besides infantile "D and V" for which a cause has yet to be found; some of these may turn out to be due to viruses. Examination of a single sample of fæces is not enough, and specimens should be taken in the acute stage of illness. Rectal swabs, which the practitioner can easily take himself, are sometimes preferable to fæcal specimens, particularly in children.—ED. L.

REACTION AFTER PNEUMOPERITONEUM TREATMENT

SIR,—A possible, and perhaps the most likely, cause of death in the two cases reported by Aslett and Jarman (March 10) is air embolism. In the fatal case of air embolism following pneumoperitoneum treatment reported by Rilance and Warring (*Amer. Rev. Tuberc.* 1944, 44, 323) symptoms appeared four days after the last refill, and they note that symptoms may appear at the time of refill or "spontaneously." In the above two cases the onset of symptoms was 56 and 31 hours after the last refill.

Rochester. F. A. RICHARDS

A CHAIR OF PSYCHIATRY

SIR,—
noticeabi
flattery
tribution to victory, some of our uniformed psychiatric colleagues seem to be in danger of losing their sense of proportion. In brief, they appear to have forgotten that morale—their veritable stock-in-trade—is commonly bolstered with adulation.

That some psychiatrists should develop narcissistic traits is however not surprising if we recall their sheltered institutionalised lives in times of peace, and the fact that, among the sciences, the psychiatric cult is but a parvenu enjoying a recent and immodest vogue in great affairs. Hence the paradox—the lack of insight for which many practitioners in psychology are notorious and the failure to apply the principles of their specialty to their personal adaptations.

To mitigate the anxiety, frustration, and distrust aroused in Service doctors (as reported by Brigadier James, Dr. Pearce, et al.) a little unfashionable reality-thinking is desirable; it is necessary to bear in mind that the majority of military psychiatrists are just those junior mental-hospital doctors who were most easily spared some years ago, and that, while their judgments on men and affairs have been heard with extraordinary though perhaps decreasing deference in military circles, it is by no means proved that their skill in finding the appropriate peg for the appropriate hole is any greater than that of other moderately educated observers (neutral or otherwise). It is also debatable whether they have gained any more useful psychiatric experience or competence than their civili
years. Indeed it is highly
mutation has rendered these
professional honours. As for their military seniors, for whom apparently Dr. Main is concerned—one can, it is true, conjure up the vision of potential professors in the jungle beating out applications for peace-time appointments on their tom-toms. But, putting this fascinating fantasy aside, it seems more likely that, wheresoever their theatre of operations, these gentlemen will be found ensconced in their club-chairs with all the resources of modern communications at their elbows.

emotional fervour of a "khaki election" and be persuaded to exalt or promote these ancillary warriors over the heads of their civilian colleagues who, having been refused permission to join the Forces, were left, depleted in numbers and without normal opportunities of advancement, to bear, often in a very real sense, the heat and burden of battle.

Much as I should like my name to appear at the end of this letter, I must ask you to withhold it. Firstly, I belong to a public service which cannot fairly be asked to give consent (explicit or implicit) to its publication. Secondly, I have not yet given up hope of being allowed to join the Forces; and possibly the appearance of these opinions over my name would be an unfortunate prelude to a military debut.

J. M.

SIR,—Other Service correspondents, whose experience abroad in positions of professional responsibility adds
the import-
have a fair
cal posts at
t further on
unty Council
in your issue of Feb. 24 except to say that it appears unnecessary for the LCC to advise the University of London on how to provide this fair opportunity. The University's reputation for a "fair field and no favour" in making its appointments is, to say the least, as good as that of the LCC. It has never made a practice of recruiting its professors entirely from its own lecturers and readers. The offering of this advice by the LCC is further evidence of that proprietary attitude towards the chair which prompted my earlier letter to you.

The latter part of the LCC's letter which sets out to remedy my "misunderstanding of how these university appointments are filled" fails to answer the points I raised. The university chair, as at present envisaged, is compounded of two ingredients. Firstly, the salaried post of director of clinical psychiatry at the Maudsley Hospital, which presumably has no duties since it has been created to enable the professor to devote his whole time to
unpaid
London.
by the
letter ar
this committee? Are they laymen whom the residents of Greater London have elected to their civic government? If so, what is the value of their opinion on the rival merit
they meml
faced with
of some of
service against those of foreign applicants. And how many are "a few"? Do their numbers equal or exceed the four university members of the committee? In any case, why are they there if the LCC does not wish to keep a string on its gift? Whose employee will the professor be? Will he be an LCC employee and thereby suffer the civil disabilities which employment by a local authority entails? Would he be able to stand for membership of the Council or of Parliament? If, like the London children's magistrates, he believed it to be his duty, would he be permitted to criticise the policy of the LCC?

It would surely be more wholesome if the LCC decided to follow the usual practice of patrons of medical educatio
leaving the filling
of
I hope that the
Ur
does not betoken consent already given and that there is still time for them to remember *Major Barbara* and look this Trojan gift horse in the mouth. They might still decide to retain their freedom of choice by devoting some of their newly increased Treasury grant to the payment of this professor?

SERVICE PSYCHIATRIST.

*** In reply to our request for further information, Mr. H. Claughton, principal of the University of London, informs us that in making appointments to chairs or readerships a selection committee (board of advisers) is set up consisting of the Vice-Chancellor and the Principal (who serve ex officio and are chairman and deputy chairman of the board), 3 subject experts (2 of whom are purely external and all of whom are selected

appointment shall be necessary. In conclusion Mr. Claughton remarks: "Perhaps I might add that, on the l
chair
had l

—ED. L.

RESTAURANT HYGIENE

SIR,—There are many points which might be answered in Dr. Linfoot's letter of March 17, but the last paragraph contains a reflection on medical officers of health which was doubtless unintended but should not be allowed to pass. If there were definite evidence implicating cracked crockery as the cause of an outbreak of illness among a number of persons using a certain restaurant, medical officers of health would know about it and would take the necessary action. The fact is that such evidence does not exist at present even though more people are using

Epidemiology and l
All will agree that a
transferred" from a cracked cup "to a healthy person," but the mere presence of a few pathogenic organisms does not necessarily foretell epidemic disease. Dr. Linfoot

may be knocked down by a four-in-hand, but it would need a number of similar accidents before the authorities became alarmed for the safety of the public and thought it necessary to limit the number of four-in-hand vehicles in the streets. This would not mean that "the authorities had not taken the trouble to investigate," but that although they know that a four-in-hand may knock somebody down they have no evidence that the danger to the general public is very great.

Ministry of Health, London, SW1. E. L. STURDEE.

PROTEIN HYDROLYSATES IN STARVATION

SIR,—In your first leader last week you refer to the evidence that in extreme cases of starvation intravenous protein hydrolysates may save life, and you say that this form of treatment must be developed. For the last 18 months a committee of the Medical Research Council has been investigating this matter, and in view of the possible need in liberated Europe has arranged for the production of these preparations on a large scale. In the course of these investigations the different preparations, both British and American, have been tested and compared. Febrile reactions have on occasion occurred with all, but we are now receiving preparations, both British and American, which provoke fever in only a minority of patients. It would be unfair both to the British and to the other American manufacturers to imply (as your leader does) that there is only one particular preparation which can be used with safety. There are several. But all are at present in short supply.

H. P. HIMSWORTH,
Chairman, Protein Requirements Committee,
Medical Research Council.

RADIO-FREQUENCY CURRENTS IN TUMOUR TREATMENT

SIR,—Further to our letter of Feb. 10 and your constructive annotation in the same issue, we note the difficulties which might be experienced in controlling the pellet temperature. In the light of recent developments on artificial radio-activity, it is understood that certain light metals, such as aluminium and magnesium, can become radio-active when bombarded with alpha-rays. In some cases this artificial radio-activity lasts for 30 minutes after removal of the exciting source. Other disintegrations have also been obtained by bombarding deuteron with gamma rays (the frequency of which is very near to that of X rays). With this in mind we would suggest that the pellet administered to the patient be of such substance that it could be radio-activated, temporarily as required. This might remove some of the difficulties anticipated in controlling the temperature of the pellet.

Baldock, Herts.

H. McCORMICK.
G. A. FORSYTHE.

Public Health

Bacillary Dysentery in Scotland

THE recorded increase in cases notified as dysentery is summarised in the accompanying table. How much of this increase is real is difficult to determine, but the following points are probably relevant:—

(1) No bacteriological confirmation is required of a practitioner before he notifies a case of dysentery. The diagnosis is a clinical one, and it is known that many patients who have been suffering from nothing more than acute non-specific diarrhœa have been notified as dysentery, especially when specific dysenteric infection has lately occurred in the area.

(2) The recovery of the specific organism from the motions has become much more reliable in true dysenteric infections, and the sensitivity of modern media is such that organisms are now being recovered from persons who are not clinically ill or only slightly affected. These are quite numerous. Bacteriological diagnosis, in fact, is now so good that it is uncovering endemic dysentery, whose presence had been suspected and partly proved for a good few years.

(3) staffs of institutions in which there are groups of y helpless persons, such as children, mental defectives, or psychotic patients, are more aware than formerly of the possible existence of dysentery in such groups. They are, therefore, searching more carefully; and what they are seeking they are liable to find.

The number of certified deaths from dysentery has been nearly static in Scotland since the outbreak of war. What this signifies is again difficult to interpret, for many more deaths are certified as due to diarrhœa and so forth, any one of which diagnoses might have been changed to dysentery if the doctor in attendance had thought of the possibility. At the same time if the proportion of *all* deaths accurately certified remains constant from year to year—which is quite a likely assumption—one would expect a real increase in dysentery to be accompanied by a real increase in deaths certified from that cause.

The present high incidence of notified dysentery is complicated by the occurrence at the same time, and often in the same place, of large numbers of cases of non-specific (or possibly virus) enteritis. This latter disease does not seem to have the selective age-incidence of dysentery, nor to be so liable to get into groups of the population which require constant nursing or domestic supervision.

The incidence has been widespread in both town and countryside in Scotland. Within the last nine months a particularly large number of cases have been seen in Glasgow and Edinburgh. To some extent groups of children have been selectively affected. Food-supplies, including milk and water, have been investigated many times with negative results, and food-handlers have also been negative so far.

Period	*Notified cases*	*Certified deaths*
1931–35 (average)	389 ..	.. 15
1936–40 (average)	1441 ..	.. 36
1941	2429 ..	.. 48
1942	2515 ..	.. 56
1943	2984 ..	.. 47
1944	4847* ..	.. 48

* Unconfirmed notifications. It is expected that the figure for accepted notifications will be somewhat lower.

The seasonal incidence has tended to change, and dysentery, which was regarded as being most prevalent in the third quarters of the year, has since the beginning of 1944 shown no special seasonal incidence. The figures have increased fairly steadily right through the period to March, 1945.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED MARCH 17

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1621; whooping-cough, 1527; diphtheria, 558; paratyphoid, 10; typhoid, 6; measles (excluding rubella), 25,266; pneumonia (primary or influenzal), 876; puerperal pyrexia, 149; cerebrospinal fever, 81; poliomyelitis, 0; polio-encephalitis, 1; encephalitis lethargica, 1; dysentery, 428; ophthalmia neonatorum, 76. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on March 14 was 1242. During the previous week the following cases were admitted: scarlet fever, 36; diphtheria, 23; measles, 166; whooping-cough, 21.

Deaths.—In 126 great towns there were 2 (0) deaths from an enteric fever, 2 (0) from scarlet fever, 26 (2) from measles, 10 (1) from whooping-cough, 11 (2) from diphtheria, 60 (6) from diarrhœa and enteritis under two years, and 27 (3) from influenza. The figures in parentheses are those for London itself.

Newcastle-on-Tyne reported the 2 deaths from an enteric fever. There were 11 fatal cases of diarrhœa at Birmingham. Leeds had 4 deaths from measles.

The number of stillbirths notified during the week was 227 (corresponding to a rate of 34 per thousand total births), including 23 in London.

THE annual general meeting of the Medical Superintendents Society will be held at BMA House, Tavistock Square London, WC1, on Saturday, April 21, at 2.30 P.M.

On Active Service

CASUALTIES

DIED

Lieut-Colonel WILLIAM SIMPSON, MB GLASG , RAMC
Captain DIRAMUID DECLAN O'CALLAGHAN, MRCS, RAMC

WOUNDED

Captain T. B. MCMURRAY, MB LPOOL, RAMC
Lieutenant S. THOMAS, RAMC

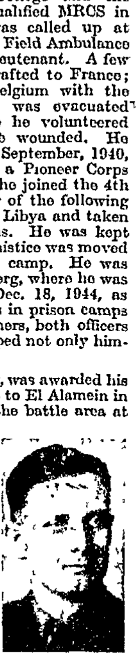
AWARDS

MC

Captain PETER DELAP, MB DUBL , RAMC
Captain L. F. MCWILLIAMS, MB BELF., RAMC

MEMOIRS

Captain R. J. FINLAY HOWE, RAMC, eldest son of Dr. and Mrs. G. H. Howe, was born at St. Leonards-on-Sea in 1913. Educated at Epsom College and the London Hospital he qualified MRCS in December, 1939, and was called up at once. He joined the 127 Field Ambulance at Savernake Forest as lieutenant. A few months later he was drafted to France; in April he entered Belgium with the British Army, and he was evacuated through Dunkirk where he volunteered to stay behind with the wounded. He was drafted to Egypt in September, 1940, and appointed RMO to a Pioneer Corps and other units. Later he joined the 4th RHA, and in November of the following year he was wounded in Libya and taken prisoner by the Italians. He was kept at several camps in Italy, and after the armistice was moved to Germany where he became MO of his camp. He was finally moved to Stalag XVIIIA at Wolfsberg, where he was senior MO and where he was killed on Dec. 18, 1944, as a result of air action. During his three years in prison camps he was very popular with his fellow prisoners, both officers and men, and his keen sense of humour helped not only himself but them.



Bee Belton

Captain B. A. MACLEAN BROWN, MC, RAMC, was awarded his decoration for his services during the retreat to El Alamein in 1942. Soon after his regiment arrived in the battle area at the beginning of June his armoured scout car broke down but he carried on in an unarmoured 15 cwt. truck. He was never at the unit's comparatively safe A1 vehicle echelon area, but chose to remain close behind the tanks where he could watch the battle and go immediately to their help. On July 3 the regiment was alongside an RHA battery under heavy fire and Captain Brown went right up to the guns seven or eight times and brought out 20 wounded gunners. Later when the regiment was heavily engaged by enemy tanks and anti-tank guns he twice went through a gap in the minefield which was under fire to render medical aid to the tanks. His complete disregard for his own safety in his unarmoured truck was an inspiration to the men in the tanks, who described him as "terrific."

Bernard Alfred Maclean Brown was born in 1912 the only son of Alfred V. Brown, a former judge in Malaya, and Margaret Helen Maclean. He was educated at Marlborough, St. John's College, Oxford, and University College Hospital, London, where he qualified in 1938, taking his BM Oxfd the following year. *After holding house appointments at the* Royal Ear Hospital and the Miller General Hospital he spent a few months in private practice in London till he joined the RAMC at the beginning of 1940. He served with the BEF in France and was attached to the force covering the evacuation from Cherbourg. After some months in Northern Ireland he was posted to the Middle East early in 1941 and the following year he was mentioned in despatches for his work with the 8th Army. He took part in the landing operations in Sicily and Italy. He was recalled to Middle East for a time but returned to Italy last August and died there on Feb. 23.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

THE House has been discussing very varied topics this week, including civil aviation, the geographical distribution of industry, and the housing problem—all matters of peace-time concern. And it has not been very happy about any of them.

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The debates showed that the transition to peace-time politics is not going to be an easy passage. The need to distribute industry over the area of the United Kingdom *in such a way as to avoid the industrial slums which*
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public
health, are obliged to take a different view from the individual entrepreneur who is concerned with getting on with his job. The country cannot afford to have derelict areas with chronic unemployment extending over many years, as in South Wales before the war.

The most acute conflict arose in the House during the housing debate. The Prime Minister promised the country *some time ago that the housing problem would* be treated like a military operation. But if this is being done we are still a very long way from the housing D-day. The number of houses built during the war is the same as the number of houses completely destroyed by enemy action. And this leaves out of account the number damaged to some degree along a scale rising from slightly to very severely indeed. Repairs being done in "Southern England"—that delectable collection of cities and counties which includes London—march some way behind the urgent demand for accommodation.

Members of all parties were critical. Mr. Arthur Greenwood, *speaking for Labour, described the Minister* of Health's proposals as "chicken-feed for a hungry

use of land some time ago—a compromise between the present methods and nationalisation—but this was rejected. Many members think that without Uthwatt control a real planned housing programme will be impracticable and disastrously expensive. The situation is bad enough now, because of the standstill in housing imposed by the war, and the deterioration due to lack of repair and maintenance imposed by the war, to which the blitzing of certain areas has added a further blitz deterioration. But what it will be when large numbers of men are demobilised after the defeat of Germany and wish to return to take up peace work is not pleasant to contemplate.

With all the temporary houses which it is possible to provide in the near future, and all the permanent building that can be done in the next twelve months, the housing supply will still be very very short. Mr. Greenwood described the situation as bleak and grim.

The Conservative member for North Hackney was severe on the Government; the Labour member for Bow and Bromley said that out of bad housing great social

who could have all the necessary powers. And this was *an opinion in which a large* number of workers concurred. What the House wants is one Minister, one big-scale plan, and a real drive to tackle a major defect in the peace planning.

Housing is, however, only one of the difficulties of peace. The sudden commotion on the food front, and some incorrect publicity in the American press, made it necessary for the Prime Minister to state that our food stocks are 6 million tons only and not—as had been suggested—700 million tons. Of this 6 million tons we are sending 1¼ million to liberated Europe by June 30. We shall certainly need to continue to grow all we can in this country for some time to come. And very clearly we shall need to reinforce our civilian medical organisation as soon as we can. For insufficient housing—or in plainer language overcrowding—and a diet which, while enough in quantity, yet lacks variety, and may be relatively deficient in animal protein, will subject the health of the nation to strain. Moreover, alongside of us, in Continental Europe, there are many areas in which the conditions will be in the future, as they are now, very much worse than our own. That no world epidemic has yet raised its head is not only the kindly act of Providence, but the result of a generally better medical service in this country and in Continental Europe as a whole than we had in the years following the armistice of 1918. But it looks as if the civilian authorities in this country, particularly local-government authorities, will have to take more heed of medical knowledge in directing their administration of housing and food-rationing if we are to avoid great dangers to national health.

OUR FOOD STOCKS

Mr. Churchill, in the House of Commons on March 20, said that in the earlier years of the war there was good reason, on security grounds, against disclosing our food stock figures. In view of the present military position that objection no longer held. He had read in the newspapers that there was an impression in some quarters in the United States that our stocks in Great Britain amounted to 700 million tons. Actually they were now rather less than 6 million tons and they were in process of being reduced by aid to the liberated countries to about 4,750,000 tons by the end of June. This latter figure was no more than was necessary to maintain a regular flow of distribution under present conditions. He thought it was worth while mentioning these facts about our stocks of food, which had been built up by foresight and self-denial over five years of strict rationing and frequent bombardment. The statement he had quoted did not emanate from the American government, but he thought it was a mistake to get widespread misunderstanding in these matters which were going to be settled in the most friendly and considerate manner by both sides.

Mr. Rhys Davies: Would my right hon. friend agree with the suggestion that so long as about half the human race continue to kill each other, and, in view of the destruction that is now proceeding, some countries may be faced with famine very shortly?—Mr. Churchill: That is quite true, and large portions of Europe may be faced with varying degrees of famine—in some cases total famine—in this forthcoming winter. That is a reason for accelerating the military operations to the utmost of our intensity.

QUESTION TIME

Whiter Bread

Dr. E. Summerskill asked the Minister of Food whether the scientific advisory committee, the special diets committee of the Medical Research Council, or the nutrition committee of the Ministry of Health or his Ministry were consulted before the extraction-rate of wheat was reduced below the 1942 standard.—Colonel J. J. Llewellin replied: The committee consulted was the Standing Committee on Medical and Nutritional Problems.

Dr. Summerskill: Can the Minister tell the House why the committees which were set up for the express purpose of advising the Minister on this subject were not consulted?—Colonel Llewellin: The committee to advise on a subject like this is the one to which it was referred. The special diets committee only advises me on diets for invalids. The main scientific advisory committee does not consist of nutritional experts but of scientists of all kinds, while the nutritional e of the Ministry of Health has had its place g the war years by the Standing Committee to which I have referred, and to which this matter was referred.

Dr. Summerskill: Were the members of the committee which the Minister consulted unanimous in their view?—Colonel Llewellin: I do not think it is ever right for a minister to disclose the nature and source of advice tendered to him. The Government takes the responsibility for the decision. However, the advice given was that it would not appreciably affect the nutritional value of the loaf.

Dr. Summerskill asked the Minister (1) to what extent his expert medical advice had indicated that white bread was deficient in nutritional content and that since the introduction of the national loaf there had been a marked decrease in the incidence of anæmia and a reduction in the sale of aperients and (2) whether he was aware that owing to the less satisfying properties of white bread it was in the interests of the millers to press for the abolition of the national loaf and against the interest of those consumers who could not afford to supplement their diet with food rich in vitamins, and what further action he was taking as a result.—Colonel Llewellin replied: I do not know whether the question refers to the present whiter loaf, which is mainly composed of the new national flour of 80% extraction. If it does, according to the advice given to the Government before the extraction-rate was altered, and according to the tests since taken, there is no appreciable loss in nutritional value compared with the previous loaf. The Government does not intend to reduce the extraction-rate further unless and until it is satisfied that the reduction would not be detrimental from the nutritional point of view.

Dr. Summerskill: Is the minister aware that the highest scientific authorities have advised him and his department that this action is not in the interests of the poorest section of the community, who are unable to supplement their diet with the richer food which contain proteins; and that this action is probably in the interests of the middle and the upper classes, and will be detrimental to the lower income groups?—Colonel Llewellin: It is certainly not in the interests of the millers. During war-time the millers are paid a management fee, so their remuneration does not depend on how much is sold as flour and how much as feeding stuffs. In fact, if that were so, they would be getting £16 per ton for flour as against £8 12*s.* 6*d.* per ton for feeding stuffs, and if they were paid in those proportions the higher the extraction-rate of flour the more money they would be making. In regard to the distinction drawn between the richer and poorer classes of the country, the Government were satisfied, before they reduced the extraction-rate, that there was no loss of nutritional value, because in the experimental station we have found new methods so as to get the germ and the endosperm into the flour, and preserve the nutritional quality. We must really march with the times and take advantage of new scientific discoveries which come to our notice.

Mr. F. C. R. Douglas: What was the nature of the tests to which the Minister referred?—Colonel Llewellin: From every mill which is milling flour samples are sent to the Ministry's cereal research station. They are tested by the experts there to see how much of these different vitamins they contain—I admit I do not know how they do it but everybody says they can—and then I get the results.—Mr. W. Leach: Will the Minister take note that most people prefer white bread, and that bakers are very sceptical of the virtues, so called, of the brown loaf?

Prof. A. V. Hill, frs, asked the Minister how many mo tons of wheat were required annually in the United Kingdo to mill flour of 80% extraction than of 85% extraction; a whether, in view of the grave shortage of food in Europ and the admitted fact that the 80% was no more nourishi than the 85% this extra, wheat would be saved.—Colon Llewellin replied: About 325,000 tons, but thereby t same tonnage of animal feeding-stuffs is provided, an amou which would otherwise have to be imported in some form order to maintain our essential livestock.

Medical Research Council.—Mr. Attlee stated th during the five years 1935–39 the expenditure of the Medic Research Council was £970,364. According to the 1944–revised estimates, for the years 1940–44 it was £1,328,606.

Penicillin Supplies in British Colonies.—Colon Stanley said that supplies of penicillin were now available the Colonies from the United Kingdom, the United States America, or Canada as is most convenient, for the treatme of all civilian cases for which penicillin is known to be effecti

Obituary

THOMAS LEWIS

KT, CBE, MD LOND., D SC WALES, LL D, F R C P, F R S

Sir Thomas Lewis died at his home near Rickmansworth on March 17. Posterity will recognise that the peculiar importance of his life lay not in his individual scientific publications, though they were numerous and important; nor in the many monographs and excellent textbooks that he wrote; but in his being the pioneer and ultimately the leader of a movement to bring the methods of science and the critical standards of science to the bedside, to the study of disease in man. It is true that others had preceded him in this, but the efforts were

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thesis; moreover, he was the first to bring, on any scale, the experimental method to the analysis of phenomena

clinical contemporaries that scientific methods and standards could be profitably applied to the patient—a doubt which not infrequently blazed into open opposition.

Lewis's achievement cannot be dissociated from the circumstances surrounding his life. On the material side his career was easier because his father was a man of means; the Beit fellowships were created at a time when his work was first becoming really fruitful, and the Medical Research Committee, later the Medical Research Council,

was equally fortunate; he was house-physician to Thomas Barlow and house-surgeon to Victor Horsley; he learnt his physiology from Swale Vincent, and he began his serious scientific work in the laboratory of Starling, with Bayliss and Cushney as neighbours and friends. Finally at the age of 26 he met James Mackenzie, and the influence of their friendship was to last throughout his life. But in the final analysis his achievement was due to his own vision, courage, and tenacity, and to his mental and technical ability. Out-

which might have dismayed a lesser man were to Lewis but calls for further exertion. He was a superb craftsman, taking the craftsman's pride in his work; despite their immense volume and variety, his writings all bear witness to the care and study given to their preparation. That his published work was so enormous—he was the author of over 230 scientific papers and 12 monographs and textbooks—and of so high a standard is eloquent testimony to his speed and capacity of execution. But

Lewis was discriminating in

undertook work which was

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e; nor did he waste his time in work in which he did not excel. In this refusal to be sidetracked from his purpose he displayed moral courage, for it often led him to be misjudged as uncoöperative by his contemporaries.

Thomas Lewis was born in 1881, the son of a colliery-owner, Henry Lewis, of Tynant, Cardiff; he was educated at Clifton and afterwards at University College, Cardiff,

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the MB, BS and other prizes. He was early attracted to a career in surgery; but, finding the atmosphere of the operating theatre too fatiguing, turned his attention to consulting medicine, took the MRCP in 1907, was appointed to the staff of the London Chest Hospital, Victoria Park, in 1906, and set up his plate. Here he wrote some clinical papers, but it was through physiology that he chose to make deeper studies of the problems

influence of respiration on the arterial and venous pulses

arrived in London; the polygraph was demonstrated, and Lewis immediately became a member of that active group engaged in the analysis of irregularities of the heart.

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polygraphic studies, he had attributed to nodal rhythm. But new evidence was needed, and Einthoven's new

commodation that could be provided for him. A rich harvest followed, most important the recognition in 1909, simultaneously with two Austrian workers, that the nodal rhythm of Mackenzie was really auricular fibrillation. More electrocardiographic studies led to the accurate and delicate analysis of the manner of spread of the excitation wave from the sino-auricular node over the rest of the heart. For this work, Lewis received his FRS in 1918, having been appointed assistant physician to University College Hospital in 1913.

The war of 1914–18 temporarily diverted the flow. In 1914 arrange-

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doned his consulting-rooms in Queen Anne Street. (He never really enjoyed consulting practice, and had

renamed, effort syndrome—had several important consequences. It led to a critical examination of the criteria for the diagnosis of organic heart disease, afterwards of great importance in the practice of cardiology. It also led to improved methods for the selection of recruits and for the treatment of soldier's heart by graduated exercises. For this work and that for the Ministry of Pensions, Lewis was appointed CBE in 1920 and knighted in 1921.

Back in his laboratory after the war, Lewis initiated a follow-up of 1000 pensioners

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Grant ten years later. He

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elaborate instrument, he now reverted to work begun when, studying soldier's heart, he investigated dermatographia and found evidence for the independent contractility of the capillaries—a discovery which shortly preceded the similar and independent discoveries of Ebbecke, Dale and Richards, and Krogh. He began a series of observations, chiefly on the skin vessels, fundamental to our knowledge of vascular physiology. Chief among his discoveries was the common pattern of the reaction of the skin to injury, which he called the triple response and identified as due to the release from the injured cells of a histamine-like substance. These investigations, like all his later and unlike his earlier work, were carried out with the simplest of apparatus.

His chief interest had now moved away from electrocardiography, and his department, financed by the Medical Research Council, became the Department of Clinical Research. The methods used so profitably for the study of vascular physiology were applied to disease, and the mechanism of Raynaud's disease and of acrocyanosis soon yielded to the new attack. Work on the consequences of arrested blood-flow to the limb followed, resulting in the discovery of the differential paralysis of nerves subserving different functions. The pain of intermittent claudication was shown by his team to be due to a chemical substance released by muscular contraction, a finding which Lewis was quick to perceive also applied to angina pectoris.

This work led him to his final interest, pain. Lewis demonstrated that pain arising from skin was of one kind and differed from deep pain. He demonstrated the intervention of chemical agents, not only in the production of cutaneous pain but also of the more widespread tenderness; his experiments forced him to attribute the latter to axon reflexes through fibres not previously known, and which he named the nocifensor nerves. Work for his laboratory showed the segmental distribution of pain arising from deep structures, and with Kellgren he demonstrated the occurrence of reflex muscular contraction and tenderness from deep somatic stimuli, thus reopening the question of referred pain that had so interested Mackenzie.

Many honours went to Lewis for his scientific work. Chief among them were the awards by the Royal Society of the Royal medal in 1927, and the Copley medal in 1941, the latter being the first award to a clinician since Lister, and by the Royal Society and the Royal College of Physicians of the Conway Evans prize this year. He was unique in having an international reputation in the two spheres of physiology and clinical medicine, and on three separate topics—the heart, the blood-vessels, and pain. He was editor of *Heart* from its beginning in 1908, and of its successor *Clinical Science* until last year. He was one of the few great editors of scientific journals, for he demanded of his contributors the same high standard of precision in thought and expression which he set himself. He was a faithful servant of University College Hospital, where he taught with unfailing regularity in the wards and outpatients; and in the second year of the war he took entire charge of the first-year students during their stay at Cardiff. He was a great teacher, for his utterances were as clear and as well composed as his writings; but he was sometimes a little above the head of the average student. He was keenly interested in medical education, publishing two thoughtful articles in this journal last summer. His last book *Exercises in Human Physiology* (which is reviewed on another page) is a constructive attempt to coordinate physiological and clinical teaching.

Outside his work Sir Thomas Lewis's interests lay in his family, his friends, and the country. His hobbies were typical of the man. Until his first illness in 1926 he spent nearly all his Sundays and holidays watching and photographing birds, accumulating one of the finest collections of photographs made by an amateur. Subsequently he took up fishing, and this, with gardening in later years, again completely occupied his leisure, for he was never idle. He was of average height but broad and physically very strong and active. Most remarkable were his eyes, which were deep-set under bushy brows and of a pure blue; his gaze was intense and very keen, for he could tell a small bird from fifty yards.

He married, in 1916, Lorna, the daughter of Mr. Treharne-James of Merthyr Tydvil, and leaves a son and two daughters.

G. W. P.

[illegible]al service to Sir Thomas Lewis was held at [illegible]s Church, London, on Tuesday last.

GEOFFREY WILLIAMS CARTE

B M OXFD, F R C S

At the age of 60 Mr. Geoffrey Carte died in London on March 6. He was the son of Geoffrey Williams Carte, who was a musician and was connected with the firm of Rudall Carte & Co., makers of musical instruments. He was a distant relative of the D'Oyley Carte family.

He was educated at Rugby and Oxford, and afterwards entered St. Bartholomew's Hospital, where he qualified in 1912 and was house-surgeon and later assistant in the throat department. In the last war he served with the Royal Navy and later as consultant to the Admiralty. In 1921 he became FRCS, and thereafter he held honorary appointments in the throat and ear department of the London Hospital, the Metropolitan Hospital, and St. Andrew's Hospital, Dollis Hill. During the present war he was a member of the Home Guard, and also devoted himself enthusiastically to ARP duties, in which service he was mentioned. In addition to his hospital work he carried on a very busy practice; for many years he was assistant to Sir Milsom Rees, and after the latter's retirement continued to treat many singers and actors. From his father he inherited his love of music and he was a regular attendant at Covent Garden. He was a keen sportsman, spending holidays in shooting and fishing, and had many hobbies, including gardening. His clubs were the Garrick and the Set of Odd Volumes, and he was a popular member. He was twice married and leaves a daughter who is at present serving in the WAAF.

F. F. M. writes: To know Geoffrey Carte was always an exhilarating experience, for—to use his own expression—he got " such a crack out of life " that it was almost impossible not to catch his zest and enthusiasm. For several years he worked with me at the London Hospital in the happiest of partnerships, throwing into his medical work the same keen cheerful spirit. Professionally, however, his main interest was with the singing and theatrical professions, where he deservedly enjoyed a wonderful reputation. A week-end at his Essex cottage was one great joy: he loved his garden and his collection of herbs; but he was keenest of all on his experiments in dwarfing well-known flowers, and he would frequently present one with a bunch of daffodils or other flowers in a matchbox. I have always been glad that I knew and worked with him.

HUGH MIDDLETON EYRES

M B EDIN

Dr. H. M. Eyres died on March 12, at the age of 73, at his home at Keswick, to which he retired after spending many years in practice at Richmond, Yorks. Educated at the City of London School and the University of Edinburgh, he graduated in 1895. After postgraduate study in Berlin and house-appointments at the Edinburgh Royal Infirmary and the Simpson Memorial Hospital, Edinburgh, he settled at Richmond. He was quickly recognised as a thoroughly competent doctor, and outside his busy practice he acted as honorary medical officer to the Victoria Hospital. B. C. K., a lifelong friend, writes: Eyres was a gentle, kindly urbane man, free from all snobbishness, with an abundant sense of humour and a great fund of good stories. Widely read, he had a keen appreciation of beauty in all its forms, and of him one might truly say he had " beauty in the inner soul, and the outward and inward man were at one."

The Ling Physical Education Association is holding its Easter holiday course at St. Paul's Girls' School, Brook Green, London, W6, from Thursday, April 5, to Wednesday, April 11. The speakers will include Prof. Samson Wright, ductless glands, Mr. A. M. A. Moore, common diseases of the foot; and Miss M. Forrester-Brown, postural defects. Lectures and discussions will also be held on penicillin, rehabilitation centres, poliomyelitis, occupational therapy, remedial exercises for chest conditions, rickets, foot deformities, and re-education of patients suffering from head injuries. A school doctor, a headmistress, and a teacher of physical education will take part in a symposium on " the relation of physical education to education as a whole." Further information from the secretary, Hamilton House, Bidborough Street, WC1.

Notes and News

A CRITIC OF ARMY MEDICAL SUPPLIES

In a paper read before the Pharmaceutical Society on March 20, Mr. W. K. Fitch, editor of the *Pharmaceutical Journal,* described his observations as a visitor to medical units on the Western Front. The packaging of drugs for the Army by some firms is, he said, a "perfect disgrace." [illegible]

[illegible] should be: it enjoyed a very low priority—except, of course, in respect of such vital products as the sulphonamides, penicillin, and dressings. Relatively no progress had been made between the wars in designing equipment; nothing had been done to ensure that the Army had adequate control over its medical supplies; and no steps had been taken to prosecute a vigorous research into military pharmaceutical problems.

It will be remembered that the Pharmaceutical Society has long been pressing the War Office to improve the status of pharmacists in the Army, and take fuller advantage of their knowledge and experience. In an answer to the Society dated March 19, 1943, the War Office stated the Army Council's opinion as follows: "The arrangements for the provision and supply of drugs, dressings, and other medical supplies for the Army in all theatres of war under War Office control are in the Council's view entirely satisfactory and after 3½ years of war there has been no breakdown or criticism of these arrangements despite the extremely difficult supply and other conditions encountered" (*Lancet,* 1943, ii, 647).

MENSTRUAL TAMPONS

Manufacturers report a growing demand for tampons which can be inserted into the vagina to absorb the menstrual flow, thus saving the wearer the inconvenience of wearing a sanitary pad. One brand now on the market is applied through a cardboard tube. A new brand ('Lil-lets') made by T. J. Smith & Nephew, consists of a sanitary towel of absorbent cotton-wool, covered in gauze, and compressed to tampon shape, which can be inserted manually. It is coated, the makers say, with a thin, readily-soluble and harmless film, ensuring easy insertion. They omit to state, however, whether the packs are sterilised—an important point since cotton-wool may harbour moulds.

Whether vaginal tampons of any type are altogether to be recommended is not yet clear. Experience at a family-planning clinic suggests that a fair proportion of women—those with stout vaginal mucosa and a moderate menstrual flow—find that tampons successfully prevent leakage and do not give rise to a vaginal discharge. Women with heavy periods, however, find them inadequate to absorb the flow; and a few, with thin or sensitive vaginal mucosa, state that they cause discharge and irritation. A few cases of severe mould vaginitis seem from the history to be associated with the use of vaginal tampons, and women who harbour *Trichomonas vaginalis* are nearly always made worse by their use. Virgins are not as a rule capable of using them. In view of their possible drawbacks and limited application doctors will probably hesitate to advise their wide employment. A guarantee that the tampons were sterile would go far to meet these criticisms, provided each tampon was enclosed in a suitable covering to preserve it from reinfection before use.

University of Oxford

Mr. Stanley Brookes has offered to the university an annuity of £1500 for seven years in memory of his daughter, and a Betty Brookes research fellowship is to be established for the study of problems of brain metabolism in relation to nervous and mental disease.

University of Cambridge

The General Board of the University have recommended (*Cambridge University Reporter,* March 14) that with the help of Addenbrooke's Hospital a department of experimental medicine should be set up in October under the direction of Dr. R. A. McCance, for whom a chair of experimental medicine would at the same time be created. Addenbrooke's Hospital have offered to elect Dr. McCance to their staff and to place at his disposal beds in the hospital and to meet his requirements for the nursing of his patients and the provision of special diets for them. The Medical Research Council have offered to provide the whole of Dr. McCance's salary as professor and they have already increased up to £2500 a year the grant which they are making towards his researches. The new department will be the first step in implementing the plan for a school of clinical research and post-graduate teaching which the faculty board submitted to the Goodenough Committee.

On March 17 the following degrees were conferred:

MD—H. B. May* and Emmanuel Cronin.*

M Chir.— J. M. Pullan* and D. I. Williams.*

MB, B Chir—G. N. Cooke,* H. L. English,* B. M. Heap,* and M. L. Graeme.

* By proxy.

University of Dublin

On March 14 at the school of physic, Trinity College, the following degrees were conferred:

M Ch—T. L. Lawson and E. E. O'Malley.

MB, B Ch, BAO—[illegible]

R. M. Dooley, M. [illegible]

L. A. Kerwood, T. [illegible]

Daniel O'Connell, a [illegible]

Royal College of Physicians of London

Surgeon Captain Macdonald Critchley, RNVR, will deliver the Croonian lectures at the college, Pall Mall East, SW1, on Tuesday and Thursday, May 8 and 10, at 4.30 PM. He is to speak on problems of naval warfare under climatic extremes.

Royal College of Surgeons of England

Four vacancies on the council of the college are to be filled by election on July 5. The vacancies have arisen through the death of Mr. Cecil Joll, and the retirement of Surgeon Rear-Admiral C. [illegible] C. Norbury, and Surgeon-Captain [illegible] all three seeking re-election. The [illegible] have also been nominated: Mr. [illegible] ton Bailey, Mr. Lawrence Abel, and Mr. A. Dickson Wright.

Royal Society

The following have been elected to the fellowship: Leonard Colebrook, MB, member of the scientific staff of the Medical Research Council; William Scott Farren, MA, director of the Royal Aircraft Establ[illegible] Feather, PH D, lecturer in [illegible] John Henry Gaddum, SC D [illegible] University of Edinburgh; [illegible] botany, University of Cam[illegible] D SC, professor of chemistry, University of Nottingham; Hildebrand Wolfe Harvey, marine biologist, Plymouth; Vincent Charles Illing, MA, professor of geology in the University of London at the Imperial College of Science and Technology; Albert Edward Ingham, MA, lecturer in mathematics, University of Cambridge; Herbert Davenport Kay, D SC, director of the National Institute for Research in Dairying, Reading; Wilfred Bennett Lewis, PH D, lecturer in physics, University of Cambridge; Kathleen Lonsdale, physicist, Royal Institution, London; Prasanta Chandra Mahalanobis, MA, professor of physics, Presidency College, and founder of the statistical laboratory, Calcutta; Rudolf Peierls, D SC, professor of applied mathematics, University of Birmingham; John Monteith Robertson, D SC, professor of chemistry, University of Glasgow; Frederick Maurice Rowe, D SC, professor of colour chemistry and dyeing, University of Leeds; Sir William Wright Smith, MA, regius professor [illegible] D SC, mechanical engineer, chief of research and development, Vickers-Armstrong Ltd. aircraft section; and John Zachary Young, MA, lecturer in zoology, University of Oxford.

Joint Tuberculosis Council

Dr. James Watt has been re-elected chairman, Dr. D. P. Sutherland and Dr. N. Tattersall vice-chairmen, Dr. A. P. Ford hon. treasurer, and Dr. Norman England hon. secretary. Ten memoranda have been prepared for UNRRA, forming a manual for [illegible]s and others dealing with [illegible] The Ministry of Health is [illegible]culosis workers in Britain. Approval in principle has been given to a proposal to establish a Tuberculosis Educational Institute.

Society of Public Analysts and other Analytical Chemists

Mr. G. W. Monier-Williams, PH D, has been elected president and Mr. Lewis Eynon, FRIC, secretary, for the forthcoming year. The address of the society is 7 and 8, Idol Lane, London EC3.

Chadwick Lecture

On Tuesday, April 10, at 2.30 PM, at 90, Buckingham Palace Road, London, SW1, Mr. A. Trystan Edwards, FRIBA, will deliver the Bossom lecture. His subject is to be sunlight and sanitation in relation to the planning of buildings.

Liverpool Psychiatric Clinic

The annual meeting of the clinic will be held at the Liverpool Town Hall on Thursday, April 12, at 3 PM, when Dr. C. H. Rogerson, director of the Cassel Hospital, will speak on the place of psychiatry in the health services of the future.

Nutrition Society

The society will hold a joint conference with the Biochemical Society on the vitamin-B complex on Saturday, April 28, at the London School of Hygiene, Keppel Street, WC1. Details of the programme will be published later. The society is also arranging a discussion on the nutritional factors affecting wound healing, to take place on Saturday, May 26, at the School.

Scottish Universities By-election

Sir John Orr, MD, FRS, director of the Rowett Institute for Animal Research, Aberdeen, is to stand as an Independent candidate at the by-election caused by the resignation of Mr. G. A. Morrison, LLD. Polling will be from April 9 to 13 and the result will probably be announced on April 14.

Health Education in Scotland

The work of the Scottish Council for Health Education, which was set up in 1943, steadily advanced last year, and 51 of the 55 major local authorities contribute to its funds. Dr. J. N. Greene Nolan has been appointed as a medical lecturer to accompany a cine-motor van on a six months' tour of the rural and highland areas, beginning early in April. Health films will be shown at each place of call and Dr. Nolan will give short talks. A summer school is to be held at St. Andrews for a fortnight from August 18, with accommodation for 180. The chairman of the council is Bailie Violet Roberton, and the offices are at 3, Castle Street, Edinburgh 2.

Royal Sanitary Institute

At a meeting to be held at 90, Buckingham Palace Road, London, SW1, on Wednesday, April 11, at 2.30 PM, Prof. S. P. Bedson, FRS, will speak on virus diseases, the mode of their spread and control.

Mrs. Churchill's Red Cross Aid to Russia Fund

As a permanent memorial to its work and as a symbol of the united sacrifices of the Soviet and British peoples this fund is to equip two 500-bed hospitals at Rostov-on-Don. After the war the hospitals will be available for the Services and civilians alike. The total cost of the hospitals will be about £400,000, and the Scottish branch of the BRCS has already sent Mrs. Churchill half this sum. Since it was started in October, 1941, the fund has raised £6,700,000, and has sent nearly 14,000 tons of drugs, hospital equipment and comforts to Russia.

Royal Society of Medicine

At the section of history of medicine on Wednesday, April 4, at 2.30 PM, Dr. Douglas Guthrie will read a paper on the patient, a neglected factor in the history of medicine. On the same day, at 5 PM, at the section of surgery, Mr. D. S. Freebody will speak on early closure of wounds, Mr. Harold Dodd on a simple method of local anæsthesia to the abdomen, and Mr. T. W. Mimpriss on retained testis. On April 5, at 5 PM, at the section of neurology, Lieut.-Colonel Ritchie Russell will discuss transient disturbance of function in gunshot wound of the head. On April 6, at the section of anæsthetics, at 2.30 PM, Dr. H. J. V. Morton is to describe the force of expiration as a sign in anæsthesia.

Poliomyelitis in United States Army

Despite the huge concentration of men from all parts of the country, and the combat conditions under which great numbers are living, the incidence of poliomyelitis in the US Army is apparently no higher than in civilian life. The number of cases was 3·4 per 100,000 troops in the United States in 1943 and 4·0 in 1944, the fatality-rate being 12·1% in 1943. This is *similar to the civilian rate for similar ages,* and *there* is a further similarity in the time of year at which the cases urred and their geographical distribution. There has [illegible] an epidemic of infantile paralysis at any US Army [illegible] this war.

A Chair of Child Health at Manchester

Some two years ago the boards of management of St. Mary's Hospitals for Women and Children and of the Manchester Royal Infirmary recommended the establishment of a chair of child health in Manchester. The council of the university are eager to support the project but lack the necessary funds. At a meeting of the Lancashire maternity and child-welfare authorities, reported in the *Manchester Guardian*, March 21, the delegates agreed to ask their local authorities for support. Prof. F. E. Tylecote, who took the chair, explained that the proposed department would train consultants in child health, of whom there was at present a great lack, and would also run refresher courses for doctors, many of whom on demobilisation from the Forces would wish to brush up their knowledge of child health. The services and advice of the professor would be available to all hospitals and contributing authorities. The university was prepared to bear the capital charge if the authorities would promise to provide the maintenance cost, £10,000 a year, for at least ten years. A further meeting is to be held in September.

LONG-ACTING INJECTIONS.—Allen & Hanburys Ltd. have *introduced a series of injectable solutions of morphine,* hyoscine, and adrenaline in which the usual acid radicals are replaced by mucate. It is claimed that combination with mucic acid will delay absorption and prolong the action of the base for 8–10 hours. 'Hyperduric MHA' contains morphine gr. ¼, hyoscine gr. 1/80, and adrenaline gr. 1/160 per c.cm.; 'Hyperduric Morphine' contains gr. ½ per c.cm.; and 'Hyperduric Adrenaline' is a 1 in 1000 solution.

Appointments

BRODIE, MABEL G., MB ST. AND., DPH, DTM & H: temp. whole-time asst. MO for Islington.
CROW, K. D., MB LOND.: casualty officer, St. Mary's Hospital, London.
HAXTON, HERBERT, MB ST. AND., FRCS: surgical chief assistant at Manchester Royal Infirmary.
HIRST, KATHERINE M., MB LOND., MMSA, DPH: acting MOH for Islington (during the absence of Dr. Freeman).
JARRETT, EDWARD, MB CAMB., MRCP: medical registrar, St. Mary's Hospital, London.
MACLEAN, ARCHIBALD, MB GLASG.: examining factory surgeon for Hamilton, Lanark.
SHORVON, H. J., MRCS, DPM: war-time chief assistant, department of psychological medicine, St. Thomas's Hospital, London.
WOOD, A. B., MRCS: RSO, Dryburn Emergency Hospital, Durham

Colonial Service.—The following appointments are announced:
ARTHUR, G. D., MRCS, MO, Falkland Islands;
BILLINGTON, V. L., MB CAMB., MO, Nigeria;
FORREST, S., MB, ADMS, Tanganyika;
GREEN, G. W., MD BRUX., LRCPE, DO, MO, Nigeria;
KINNEARD, G., MD, MCPS., CPH, DMS, Fiji;
SLINGER, L. A. P., MB., senior MO, St. Lucia.

Births, Marriages, and Deaths

BIRTHS

BACKUS.—On March 20, at Birmingham, the wife of Captain A. B. Backus, RAMC—a daughter.
KENNISH.—On March 22, in London, the wife of Dr. Peter Kennish—a daughter.
KILPATRICK.—On March 20, at Northampton, the wife of Major J. A. Kilpatrick, RAMC—a daughter.
LLOYD.—On March 18, the wife of Surgeon Lieut.-Commander O. G. Lloyd, RNVR—a daughter.
REAVELL.—On March 18, at Gloucester, the wife of Dr. Denys Reavell—a son.
ULYATT.—On March 19, at Amersham, Bucks, to Dr. Frances M. Ulyatt (née Douglas), the wife of Flying-Officer Kenneth Ulyatt, RAFVR—a son.

MARRIAGES

HALLETT—HAMMERSLEY-SMITH.—On March 17, in Cairo, Geoffrey Norman St. John Hallett, major RAMC, to Patricia Hammersley-Smith.
ROBINSON—JOHNSON.—On Feb. 27, in London, George Albert Robinson, surgeon lieutenant RNVR, to Eunice Joy Johnson, chief officer, WRNS.
SWEET—BARNES.—On March 1, in Nairobi, Hector Struthers Sweet, captain RAMC, to Audrey Elaine Barnes, VAD.

DEATHS

BALDWIN.—On March 18, Aslett Baldwin, FRCS.
RATTRAY.—On March 17, at Treharris, Glam., Alexander Mair Rattray, MD EDIN.
TAYLOR.—On March 9, at Northampton, George Lees Taylor, MD MANC., PH D CAMB., FRCP, aged 47.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

THE WYNDS OF GLASGOW

A HUNDRED YEARS OF PROPERTY OR LIFE

TOM GARLAND, M D CAMB., D P H

PRINCIPAL ASSISTANT MEDICAL OFFICER, MIDDLESEX COUNTY COUNCIL

BY way of a centenary celebration, I have just been re-reading Frederick Engels's book on social medicine[1] —at least, that's how I think of it. When I realise that this material was collected when Engels was only 23 and was working in a foreign land, I am forced to admire him more and more. He gives a more complete picture of working-class life in the 1840's than any other I know. There is a wealth of evidence, backed by scores of contemporary references, not only about the insanitary conditions in the towns, but about diet and food contamination, medical services and quack cures, disease and danger in various industries, and all presented with piquant comment. There is only one other man with [illegible]

for consideration today; in particular with regard to slums, for we are now presented with the need for the boldest building programme ever contemplated in this country. All those who favour an adequate programme will require some careful mobilisation and training, if they are to succeed in abolishing old and avoiding new slums, wynds, or what-have-you.

Writing of the wynds of Glasgow, Engels quotes J. C. Symonds, a Government commissioner for the investigation of the conditions of the hand weavers:

> "I have seen wretchedness in some of its worse phases both here and upon the Continent, but until I visited the wynds of Glasgow I did not believe that so much crime, misery, and disease could exist in any civilised country. In the lower lodging-houses ten, twelve, sometimes twenty persons of both sexes, all ages and various degrees of nakedness, sleep indiscriminately huddled together upon the floor. These dwellings are usually so damp, filthy, and ruinous, that no-one could wish to keep his horse in one of them."

Edwin Chadwick had the same opinion of these alleys, and in his 1843 report[2] he writes:

> "The prisons were formerly distinguished for their filth and their bad ventilation, but the descriptions given by Howard of the worst prisons he visited in England (which he states were among the worst he had seen in Europe) were exceeded in every wynd in Edinburgh and Glasgow inspected by Dr. Arnot and myself, in company of the Municipal Officers of those cities. More filth, worse physical suffering and moral disorder than Howard describes as affecting the prisoners are to be found among the cellar populations of the working people of Liverpool, Manchester, or Leeds, and in large portions of the metropolis. . . . The medical practitioners . . . concur in vouching . . . that the health of the prisoners is in general much higher almost than in any part of the surrounding population."

The wynds of Glasgow, of course, are only a bad example of the slums to be found in scores of industrial towns, but I was reminded of the above quotations three months ago, by receiving a letter from a colleague in which occurred the sentence, "No-one can know the full meaning of social medicine without seeing the conditions of life in Glasgow." He evidently thinks that the wynds of Glasgow are still unhealthy, and no-one will assert that Glasgow is the only town where slums of a hundred years ago still remain uncleared. For evidence of the significance of these slums, I would refer to the Royal Commission's report on these matters in 1844.[3]

From the mass of evidence available that would bring this report relatively up to date, one might mention that the 1935 Overcrowding Survey revealed that the City of Birmingham at that date still contained 38,733 back-to-back houses, 51,791 houses without a separate water-closet, and 13,050 houses without a separate water-supply.[4]

With special reference to Glasgow, a particularly outspoken report recently published[5] declares that "Glasgow, in 1934 to 1938, had a higher infant-mortality rate than any other of the twenty-four large burghs in Scotland, or any of the eighty-four county boroughs of England and Wales." In Glasgow in 1938, 87 infants *died in the first year of their lives, per thousand live* births, as against a rate of 50 for London, 38 for New York, 34 for Chicago, and 31 for Amsterdam. The same report asserts that "in Glasgow experience has shown by rehousing alone the death-rate in young children from respiratory disease can in some instances be reduced by more than half, while the incidence of the commoner infectious diseases is materially reduced."

THE BALANCE-SHEET APPROACH

In the past, social health measures, unless they obviously affected all classes, such as the vaccination laws and those controlling infectious diseases generally, have had to be argued on a business basis. What could not be justified by reference to the balance sheet of those in power has received scant consideration.

The [illegible] al health in the last
century [illegible] today on the portals
of the L [illegible] was Edwin Chadwick.
He developed this balance-sheet" approach in all his campaigns. His 1834 Poor Law Amendment Act was pre-eminently a business proposition—even the Duke of Wellington approved of it—and as such it was extremely successful. The handicraftsmen were forced into the factories rather than face the workhouse, thus easing the shortage of labour in newly-developing industry, while expenditure on relief, which now became conditional on residence in a workhouse, dropped enormously. (Poor Law expenditure[6] in 1831 was £6½ million and in 1841 was £500,000.) Just how far this attitude could go in denying human beings elementary rights is evidenced by the rule which forbade husband and wife to live together in the workhouse, on the grounds that the previous rule "had filled the parish workhouses with pauperised children."

In 1833, Chadwick had been appointed as one of the Central Commission to examine into the labour of children and of young persons employed in factories. One of the findings of this commission was that:

> "Physically the effects of excessive hours of labour were *aggravated by the bad sanitary conditions of ill-ventilated* and ill-drained workshops, and ill-drained and ill-ventilated dwellings, while the economical results, waste of working force, were such as would be the case if the farmer, to obtain one working horse, had to raise two colts, or as if the adult working horse, when raised, lasted only two-thirds of the productive time that would be obtained under better sanitary conditions."[7]

As he became older, Chadwick became still more blatant. In an address before the National Association for the Promotion of Social Science, on the opening of the session 1869–70, he said,

> "I [illegible]
> servit [illegible]
> which [illegible]
> of cap [illegible]
> we have to [illegible] iew
> to the retur [illegible] ove
> the cost of [illegible]"

Chadwick was a strong advocate of half-time education *for children in factories.* "The most ignorant of the workmen were not only the most dangerous, but were becoming the most unprofitable." But he opposed whole-time education as a waste of time for these same children. The unemployed he refers to as "excessive manufacturing labour," and here is an argument of his for better recreation facilities for workers:

> "On the holiday given at Manchester in celebration of Her Majesty's marriage, extensive arrangements were made for holding a Chartist meeting, and for getting up what was called a demonstration of the working classes, which greatly alarmed the municipal magistrates. Sir Charles Shaw, the Chief Commissioner of Police, induced the mayor to get the Botanical Gardens, Zoological Gardens, and Museum of that town, and other institutions, thrown open to the working classes at the hour they were urgently invited to attend the Chartist meeting. The mayor undertook to be personally answerable for any damage that

> occurred from throwing open the gardens and institutions to the classes who had never before entered them. The effect was that not more than two or three hundred people attended the political meeting, which entirely failed, and scarcely five shillings' worth of damage was done in the gardens or in the public institutions by the workpeople, who were highly pleased. A further effect produced was, that the charges before the police of drunkenness and riot were on that day less than the average of cases on ordinary days." [8]

There has been much progress in advancing social health in the past hundred years, and much credit goes to men like Chadwick, but in the realm of slum clearance there has been a significant failure, for slums cannot be cleared by the direct balance-sheet approach —they are very profitable to their owners as they are—though terribly costly to the nation.

THE HUMANIST APPROACH

Engels in his book never argues from the premises that Chadwick adopted. To him men and women are worthy of certain standards as human beings—they are never discussed in terms of capital investments, or as colts and horses.

> "I am far from asserting that *all* working people live in such want as the foregoing three families. I know very well that ten are somewhat better off, where one is so totally trodden underfoot by society, but I assert that thousands of industrious and worthy people . . . do find themselves in a condition *unworthy of human beings;* and that every proletarian, every one, without exception, is exposed to a similar fate without any fault of his own and in spite of every possible effort" [1] (my italics).

While Chadwick is often to be found using phrases such as "considering how large a proportion of the labouring people are deficient in the habit of self-control," Engels writes:

> "Drunkenness has here ceased to be a vice, for which the vicious can be held responsible; it becomes a phenomenon, the necessary, inevitable effect of certain conditions upon an object possessed of no volition in relation to those conditions." [1]

While Gaskell, surveying the mill-workers of Manchester writes:

> "The real evil lies in the habits of the people themselves; habits, it is true, generated by a system of factory labour but decidedly not of necessity dependent upon it." [9]

Engels, commenting on the same phenomena asks:

> "How can people wash when they have only the dirty Irk water at hand, while pumps and waterpipes can be found in decent parts of the city alone?" [1]

PROPERTY OR LIFE

Our rulers have tolerated the slaughter of the innocents for a hundred years in Glasgow and in scores of other industrial towns in Great Britain—otherwise the slums would not still be there. Engels a hundred years ago slammed down the evidence and delivered judgment as straight as that delivered upon the Temple money-changers.

> "I have now to prove that society in England daily and hourly commits what the working-men's organs, with perfect correctness, characterise as social murder; that it has placed the workers under conditions in which they can neither retain health nor live long; that it undermines the vital force of these workers gradually, little by little, and so hurries them to their grave before their time. I have further to prove that society knows how injurious such conditions are to the health and life of the workers, and yet does nothing to improve these conditions. That it *knows* the consequences of its deeds; that its act is, therefore, not mere manslaughter but murder." [1]

Engels proved his case by citing official documents, inter-departmental committee reports, debates in the House of Commons, scientific journals, current newspapers, and so forth, and his case could be proved again a hundredfold up to the present time. The whole issue—Property or Life—has been sharply raised lately in the debate in the House of Commons on the Town and Country Planning Bill.

> "The important principle which is coming is that life is important than property. If there is any hon. Member present who will dare to get up and deny that quite simple statement, let us have it, and if anybody thinks that property is more important than life let him say so. Otherwise let us accept the principle that life is more important than property, and let us see where we go from there." [10]

This is a crucial issue for all interested in social health, for the only real reason that has operated to hinder the demolition of the wynds of Glasgow and similar slums appears to be that property has had priority over life. No such priority was accorded the insanitary conditions that fostered cholera in the last century. Piped water-supplies to the towns, closed-in sewage systems, and the paving of urban streets, were initiated and carried out on a gigantic scale. This was the realm in which Chadwick was immensely successful. This was due largely to the fact that cholera was not so selective of social class in dealing death as are slums—only one class lives in slums, but the sewage-polluted water of the Southwark and Vauxhall Company in 1853 was drunk by influential people in addition to slum dwellers. Whenever vested interests appeared to be mobilising to hold up municipal sanitary reform a further outbreak of cholera reminded these citizens that their lives were of more value than a saving in taxes on their property.

Slums *could* go—just as open sewers and unpaved streets went. A ten-year programme carried out with the same skill, self-sacrifice, and energy as has gone to the production of aircraft and tanks in the last four years, and having the same priority of materials and labour, would go far towards accomplishing the task. Curiously enough I believe that the two programmes lead us to a common goal.

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PULMONARY CONCUSSION ("BLAST") IN NON-THORACIC BATTLE WOUNDS

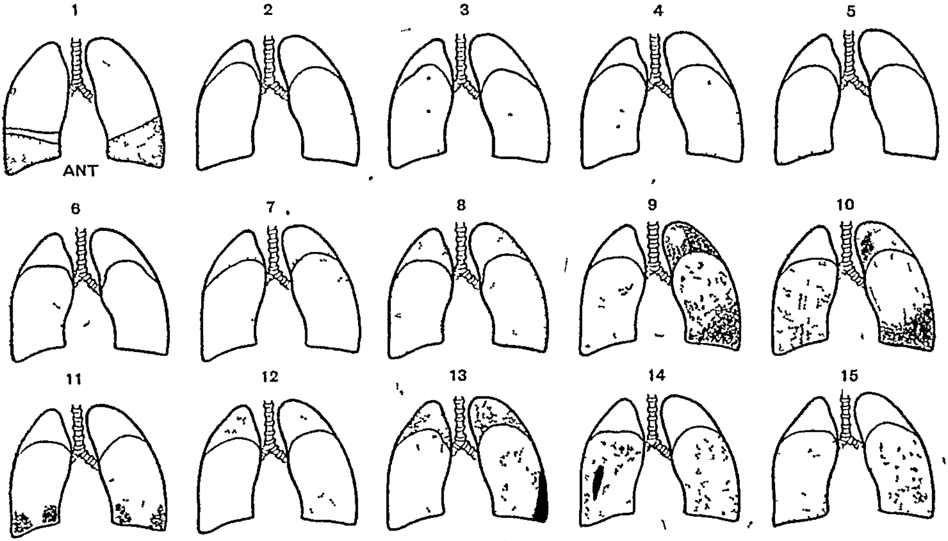
OSWALD SAVAGE, M R C P
LIEUT.-COLONEL RAMC; OFFICER I/C MEDICAL DIVISION AT A BRITISH MILITARY HOSPITAL, CMF

DURING the battle for Rome this hospital was admitting casualties principally to the attached neurosurgical and maxillofacial units. In the early days, during the battle for Cassino, owing to the excellent method of triage, such cases were arriving within 6–12 hours of wounding. As a consequence many severe wounds of the head and face arrived in hospital straight from the battlefield with minimal halts for resuscitation. Later in the campaign, when the lines of communication were longer, some cases were received after operation at the forward sections of these units. Two cases included in this series were flown back from the South of France beachhead.

While doing autopsies on some of the earlier cases Lieut.-Colonel P. B. Ascroft found that a number showed small intrapulmonary hæmorrhages suggestive of blast lungs though there had been no evidence of chest damage. He suggested that I should investigate this. Between May 12 and Aug. 22 complete autopsies were done on 87 battle casualties. They were made up of the following major wounds:

Penetrating head wounds	41
Penetrating head and other wounds	19
Spinal wounds	8
Maxillofacial wounds	8
Closed head wounds	6
Burns	3
Other wounds	2
	87

MACROSCOPIC APPEARANCES OF THE LUNGS AT AUTOPSY



1 Blast lung in anterior part of both lower lobes (anterior view)
2. Blast lung in both lower lobes posteriorly (figs 2–30 are posterior views)
3 Hæmorrhages scattered through both lower lobes *Microscopically* Considerable hæmorrhage filling the ruptured alveoli
4 Scattered hæmorrhages into lower lobes
5 Hæmorrhages in left lower lobe
6 Pin point hæmorrhages on surface of both lower lobes Left lower lobe studded with hæmorrhages
7 All lobes show circular hæmorrhages more pronounced in lower lobes
8 Cone shaped areas of hæmorrhagic consolidation on surface of lungs
9 Right pleural cavity contained ½ pint of blood Parts of right upper and lower lobes solid with hæmorrhages Left lower lobe contained scattered hæmorrhages *Microscopically* Widespread intra alveolar hæmorrhages containing fresh red cells consistent with blast lung and survival for a period
10 Posterior surface of right lower lobe and lower part of right upper lobe solid with small hæmorrhages Left lower lobe contained many hæmorrhages *Microscopically* Hæmorrhagic patches with fresh red cells in the alveoli
11 Cone shaped areas of hæmorrhages in both lower lobes at lower border
12 Scattered hæmorrhages throughout both lungs
13 Right lower lobe showed a large subserous hæmorrhage with hæmorrhages scattered in the lobe Left lower and upper lobes contained scattered hæmorrhages *Microscopically* Intra alveolar hæmorrhage and œdema
14 Hæmatoma 8 × 5 cm on posterior surface of left lower lobe Both lower lobes studded with hæmorrhages up to 1 cm in diameter
15 Both lower lobes profusely shattered with small hæmorrhages Scattered hæmorrhages on diaphragm

In 30 of these cases lung changes were found which were considered to be due to blast In the earlier cases there was no evidence before death that the lungs were affected, but later in the series, when routine chest X ray films were taken in patients who might have been exposed to blast, the typical radiological changes were sometimes found

The time between wounding and death varied from under an hour to 83 days In the table the cases have been numbered according to this interval

MACROSCOPIC APPEARANCES AT AUTOPSY

The lungs were large and in the majority the surfaces showed no change, but on sectioning them a striking
“spatter” some these had
oak seed t always in the
lower lobes posterior costo-
phrenic fringes Circular areas of hæmorrhage about 1 cm in diameter were scattered throughout the lung
ated centre with a
off into the norm
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stie (1941)

As will be seen from figs 1–30, the lower lobes were mainly affected, but on an average the distribution throughout a lobe was uniform from periphery to hilum This is contrary to Zuckerman's findings (1940, 1941) that small hæmorrhages are subpleural In 7 cases there
wer the parietal
ple fly affected
alo cases there
we rders of the
rib

Hæmorrhages beneath the visceral pleura were present in 10 cases Mostly round the roots of the lungs they bore no relation to the amount of bleeding found in the lung parenchyma, and we saw no lines of hæmorrhage corresponding to the ribs as described by Wakeley (1943)
Purple patches o
posterior surface c
no relationship tc
cutting the lung
from blood, so the possibility of inhalation “blood
spots,” descri cluded, though
these were sc and accident
cases coming

To obtain a record of the distribution of the hæmorrhages many of these lungs were reinflated at autopsy and X rayed Two types of picture were seen, as shown in figs 31 and 32—

(*a*) (fig 31) scattered opacities, sometimes confined to one lobe

(*b*) (fig 32) as in (*a*) but in parts the hæmorrhages are so numerous that an appearance of consolidation is given In this area the larger bronchioles are patent

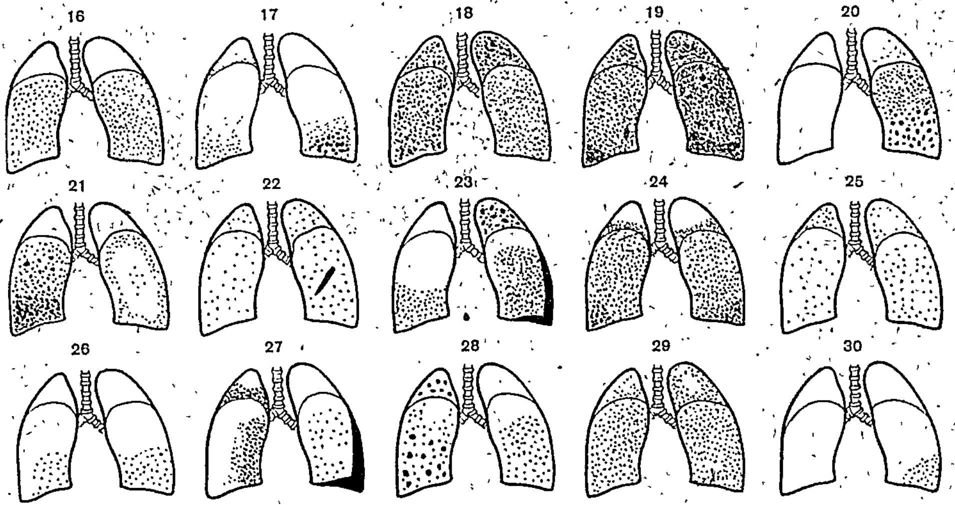
In these 30 cases evidence of blast hæmorrhage elsewhere in the body was seen 10 times The liver was found bruised in 6 patients In each there was bleeding into the falciform ligament, and in 3 the surface of the organ showed small areas of superficial hæmorrhage Hæmorrhages on the surface of the heart were seen [illegible] times, the anterior wall of the left ventricle being most affected, in each case the pericardial fluid was faintly blood stained Small areas of hæmorrhage were seen in the pancreas spleen, and colon, each on one occasion In every case where an abdominal organ was implicated there was bleeding into the retroperitoneal tissues

BLAST LESIONS IN BATTLE CASUALTIES

Case	Degree of blast in lungs	Method of wounding	Wounds	Clinical condition	Time before death
1	Mod.	Cannon shell exploded while held to abdomen	Thoracoabdominal penetrating; traumatic amputation of hand; multiple injuries of hand and face	Admitted dead	Under 1 hr.
2	Sl.	Mine explosion at 25 ft., partly screened	Penetrating head injury	Admitted dead	9 hr.
3	Sl.	Ditto	Penetrating head injury	Died 18 minutes after admission	9¼ hr.
4	Sl.	Unknown	Penetrating head injury	Unrousable. P 52. BP 125/70. Quiet breathing. Corneal reflexes absent	20 hr.
5	Sl.	In tank	Penetrating head injury, burns of trunk, limbs, and face	Drowsy, confused. P 104. BP 125/90. Colour grey. Breathing stertorous. "Not fit for surgery"	25 hr.
6	Mod.	Anti-personnel mine	Penetrating head injury; flesh wound of thigh	Dazed and confused. P 78. BP 115/70. Rt hand flaccid. Discs blurred	26¼ hr.
7	Mod.	Shell	Penetrating brain injury; lt eye destroyed	Condition poor. Pulse hardly felt. No response to stimuli. Brain protruding and lt side of face shot away	27 hr.
8	Sl.	Mortar	Face injury with fractured mandible	General condition fair	30 hr.
9	Sev.	Shell	Penetrating head injury; abdominal; flesh wounds of legs. At opn: FB lying behind colon; bullet had traversed pleura, liver into kidney	Condition [illegible] 112. BP 95/65. [illegible] by head." X ray: [illegible]	36 hr.
10	Sev.	Unknown	Penetrating head wound	Unconscious. P 120. BP 125/70. Breathing deep. Rt flaccid hemiparesis. X ray consistent with blast lung	39 hr.
11	Sl.	Shell	Penetrating head wound; superficial wounds of arm	Unconscious. P 64. BP 110/60. Lt hemiparesis. Jaundiced	41 hr.
12	Mod.	Shell	Penetrating head wound	Unconscious. P 70; volume good. lower limbs flaccid	45 hr.
13	Sev.	Unknown	Penetrating head wound	Unconscious. P 80. BP 125/70. Lt flaccid hemiplegia. X ray consistent with blast lung	59 hr.
14	Mod.	Unknown	Closed head injury; lacerations arm and leg; bruised chest	Unconscious. P 60. Rt facial weakness; doubtful localising signs. Lt hemisphere: breathing shallow. Sounds harsh; X ray suggests blast lung	83 hr.
15	Mod.	Stepped on mine	Multiple injuries of limbs and face	Condition poor. P 130. BP 100/60. Cyanosed at times. White blood-cells 23,000 per c.mm.	104 hr.
16	Sl.	Unknown	Penetrating head injuries; comp. fracture humerus	Comatose. P 100. BP 110/45. Rt spastic hemiparesis	104 hr.
17	Mod.	Shell	Penetrating brain injury	Semicoma. P 96. Lt hemiparesis. X ray skull shows indriven fragments of bone	112 hr.
18	Sev.	Shell	Penetrating head injury; flesh wounds loin, thigh, and shoulder	Confused. P 90. BP 120/90. Colour and breathing good. Lt flaccid paresis	124 hr.
19	Sev.	Unknown	Penetrating head injury. Brain oozing from supraorbital wound	Comatose. P 70; volume poor. Colour and breathing good. Rt facial palsy. Rt flaccid paresis	136 hr.
20	Mod.	Shrapnel	Penetrating head wound; flesh wound lt thigh	Rousable only by noxious stimuli. P 100. BP 105/65. Rt arm and leg spastic	7 days
21	Sev.	Shrapnel	Penetrating head wound; flesh wounds abdomen, arm, and leg	Unconscious. T 102° F. P 96. BP 125/80. Lt. hemiparesis and lt hemianopia	7 days
22	Sl.	Mortar	Penetrating head wound; flesh wound shoulder	Dazed, confused. P 90. BP 120/90. Breathing good. Rt facial weakness. Meningitis on 6th day	8 days
23	Mod.	Mine	Spatter wounds of chest, penetrating injuries of face, scalp, and limbs. Fracture of lt 6th rib	Condition fair and remained good until sudden collapse on 8th day. X ray consistent with blast lung	8 days
24	Sev.	In tank	Severe burns face, hands, legs; fracture of os calcis	P 125. Cyanosed. Burns probably full thickness loss. Condition deteriorated after air travel	9 days
25	Sl.	Shrapnel	Penetrating head wound; flesh wound shoulder	P 60. BP 110/60. Both arms and legs spastic. Brain exposed. 8th day clinical meningitis	10 days
26	Sl.	Shrapnel	Penetrating head wound	P 92. BP 100/80. Herniation of brain. Spastic paresis rt arm and leg. 8th day clinical meningitis	18¼ days
27	Sev.	Mortar	Spinal wound level D 9 and 10. Brain protruding and lt side of face shot away	Condition poor. Pulse hardly felt. No response to stimuli	27 days
28	Mod.	Unknown	Spinal wound level D 7; buttock wound	Condition fair. P 90. BP 125/75. Paraplegia	27 days
29	Sev.	Ammunition in tank blew up beside him when hit by shell	Multiple 2nd and 3rd degree burns; fractured humerus	Condition poor. P 96. Deep burns, 2000 sq. cm. X ray consistent with blast lungs. No sputum. Hb. 60%. Pl. protein 5·8. Remained very ill and died with respiratory distress after resuscitation	37 days
30	Sl.	Tank hit by shell and blew up	Wounds of face and trunk, hands and legs; rt frontal brain wound; rt eye destroyed	Condition fair. P 108. BP 128/80. Eventually developed pyarthrosis rt knee and had leg amputated.	85 days

mod. = moderate; sl. = slight; sev. = severe.

MACROSCOPIC APPEARANCES OF THE LUNGS AT AUTOPSY



16. Fibrinous pleurisy over lower lobes. Hæmorrhages on surface of lower lobes and scattered through these lobes.

17. Hæmorrhages in both lower lobes and along lower edge of left upper lobe. Right lower lobe showed secondary bronchopneumonia.

18. Surface hæmorrhages on lower lobes. Pin-point hæmorrhages in substance of upper lobes. *Microscopically*: Lesion typical of blast; hæmorrhagic patches with fresh red cells in the alveoli.

19. Small hæmorrhages throughout all lobes At the bases these have coalesced, but the affected parts still float. At least half the lung tissue is involved.

20 Pleurisy over right ower lobe, which is studded with bronchopneumonia and hæmorrhages.

21. Left lower lobe solid with patches of bronchopneumonia and small hæmorrhages. Right lower lobe to depth of 3 cm. spattered with hæmorrhages up to 2 cm. in diameter. *Microscopically*: Massive hæmorrhagic consolidation of left lower lobe.

22. Pleura slightly bloodstained. Hæmatoma 4 × 5 cm. on posterior surface of right lower lobe. Scattered hæmorrhages throughout all lobes, nowhere intense.

23. Tiny wound penetrating to anterior mediastinum with much bruising. Pin-point perforation of pleura, below 6th left rib, with surrounding bruising. Confluent bronchopneumonia in right upper lobe. Hæmatoma in right lower lobe.

24. Pin-point hæmorrhages on surface of lungs. Both lower lobes and lower part of upper lobes spattered with hæmorrhages. Half pulmonary tissue out of action.

25. Scattered hæmorrhages throughout all lobes.

26. Old circular hæmorrhages typical of blast in both lower lobes.

27. Hæmatoma with a few old hæmorrhages in right lower lobe. Many hæmorrhages deep in left lower lobe. Left upper lobe solid, with hæmorrhages in lower part.

28. Left pleura contained ½ pint of blood-tinged fluid. Small hæmorrhages spattered throughout right lower lobe, with some softening. Left lower lobe contained a few hæmorrhages with patches of bronchopneumonia. Left upper lobe: bronchopneumonia. *Microscopically*: Bronchopneumonia.

29. Hæmorrhages up to 1 cm. in diameter throughout all lobes except left upper lobe, most definite in lower lobes; they appeared to be fairly recent.

30. Small amount of old blast hæmorrhage in right lower lobe.

MICROSCOPIC APPEARANCES

Dr. Joan Ross saw many of these lungs during fixation and kindly examined some of the sections for me. Of those she saw she reports—

Case 9 (36 hours).—The lung shows widespread intra-alveolar hæmorrhage. At the edge of the more hæmorrhagic areas fresh red blood corpuscles are present in the alveoli with scanty polynuclears and occasional macrophages. Consistent with blast injury and survival for a period.

Case 13 (59 hours).—The hæmorrhages are much more discrete than in Case 9. Generalised capillary congestion is present. Some alveoli contain fibrinous coagulum with entangled red blood corpuscles and macrophages. Macrophages are present throughout and some polynuclears and some alveoli are filled with these cells.

This indicates a pneumonia following on intra-alveolar hæmorrhage. This patch coincides almost exactly with some areas in Hadfield's case (1941) surviving 57 hours after being exposed to the blast of a land-mine.

Case 18 (124 hours).—Naked eye the section shows hæmorrhagic areas which are not entirely airless and have a somewhat diffuse outline. In the hæmorrhagic areas there are fresh blood corpuscles in the alveoli and in some of the bronchioles.

In some of the lungs Dr. Ross also had sections examined for fat emboli, since this was a possible cause of these hæmorrhages. No fat emboli were found.

CLINICAL CONDITION

Most of these patients were unconscious while under observation. They had no external evidence of thoracic damage and had major wounds elsewhere, so it is not surprising that the pulmonary hæmorrhages were unsuspected, in the early cases, but even when we began to find these at autopsy and looked particularly for clinical signs or pulmonary abnormality in the later cases, these were remarkably sparse.

None of the patients had hæmoptysis. The pulse-rates were only slightly raised, and the blood-pressures were within normal limits, but in many there was some respiratory distress with stertorous breathing. Major J. Shoreston, the neurosurgeon, recorded in the notes of two of these patients: "His general clinical condition would appear not in keeping with the nature of his head injury." Physical signs in the chest were minimal and confined to adventitious sounds scattered all over the lung, but more pronounced at the bases—little enough abnormality in men who often had been in coma for some hours.

Radiography provided [illegible] hæmorrhages in the shap[illegible] mottling (fig. 33). It w[illegible] that the hæmorrhages were more widespread than the ante-mortem pictures suggested. Such an X-ray appearance is not caused only by blast hæmorrhages—it is consistent with scattered bronchopneumonia, silicosis, and other conditions. However, in a patient who may have been exposed to blast, whose clinical condition is worse than his wound warrants, with a pulse-rate only slightly raised, and a blood-pressure within normal limits, it is very strongly suggestive of alveolar hæmorrhage.

DISCUSSION

In this series of 87 autopsies on battle casualties over a third showed some degree of "blast" lung assessed as severe, moderate, or slight. This assessment was made on the presence of consolidation, the area of lung involved, and an estimate of the number of hæmorrhages. In 23 of these cases showing lung hæmorrhages it was certain that they had been exposed to blast: in the remaining 7 the method of wounding was unknown. Most of the cases were penetrating head wounds, because these were concentrated at this unit, but there seems no reason to suppose that blast lung occurs less often in other casualties where blast is a factor.

There is now sufficient evidence to establish that these pulmonary hæmorrhages are due to blast. Hooker (1924) showed that hæmorrhagic lesions of the lungs and other visceral organs are prevalent in animals subjected to blast, and Zuckerman (1941) found that animals exposed to blast from 70 lb. of high explosive at a distance of 18 ft. died within a few minutes to 24 hours, and that the most conspicuous changes found were lung hæmorrhages. Bernal (1941) concluded that the force of blast would have to be 100 lb. to the square inch before a human being would be endangered, and Zuckerman that a man would be safe 30 ft. from a 50 kg. bomb. Cases 2 and 3 in this series were 25 ft. from a mine with the lower parts of their bodies screened by an embankment; each showed a slight degree of blast lung. Zuckerman has shown by extensive experiments on animals that the injury is due to the impact of the blast wave on the body wall, and has I think disposed of the other theories as to causation.

In both experimental and human cases killed outright by blast, the amount of hæmorrhagic consolidation or hepatisation is remarked upon, though Hadfield (1941b) mentions the variation in the amount of hæmorrhage in fatal cases. In only 6 of the present cases was there sufficient *consolidation* to make the lungs sink and in these only small areas were involved. The striking feature of the lungs was the discreteness of the hæmorrhages, though in some of the severe cases it was estimated that half the pulmonary bed had been put out of action. This lack of consolidation may account for the absence of hæmoptysis as a symptom. For example:

CASE 15.—A sapper who stepped on a mine sustained a fractured mandible, traumatic amputation of the right foot, and a penetrating wound of the right eye. None of these should have killed him, yet he died 104 hours after wounding in spite of resuscitation and treatment. He had no pulmonary symptoms but routine X-ray films showed the fluffy mottling of alveolar hæmorrhage.

At autopsy the wounds were clean. The lungs were purple on the posterior aspect but there were no surface hæmorrhages. On section they showed small hæmorrhages scattered profusely throughout both lower lobes, with some œdema of the upper lobes. There was no blood in the trachea or bronchi. The abdomen also showed evidence of blast, in the shape of a pint of slightly blood-stained fluid in the peritoneum, a suffused and œdematous omentum, and an ischæmic area 3 cm. in diameter in the stomach surrounded by petechial hæmorrhages. There were hæmorrhages in the diaphragm, and the liver contained areas of purple staining 2 cm. in diameter extending 2 cm. into the organ.

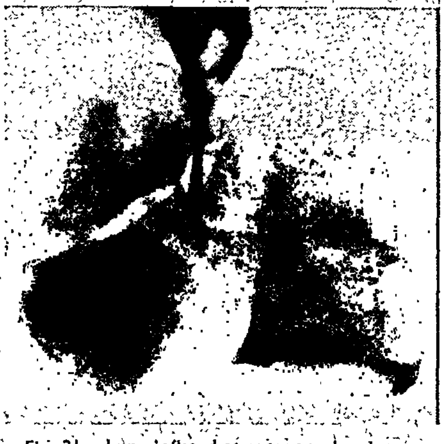


Fig. 31.—Lung inflated at autopsy, showing scattered opacities.

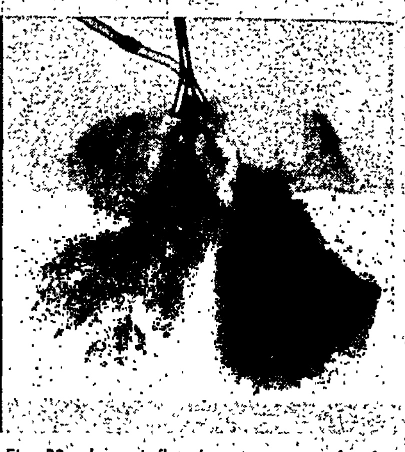
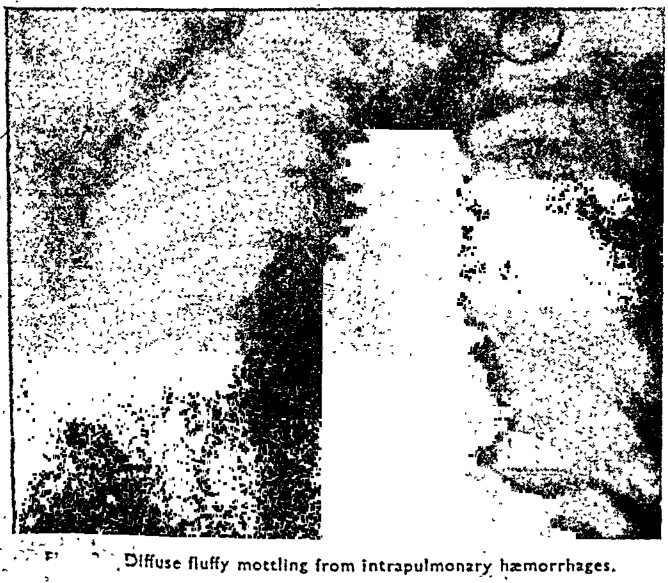


Fig. 32.—Lung inflated at autopsy, showing appearance of consolidation from numerous hæmorrhages.


Diffuse fluffy mottling from intrapulmonary hæmorrhages.

The blast lesions played a large part in killing this man. In 9 of the 30 cases with pulmonary changes the blast was assessed as severe, in 10 as moderate, and in 11 as slight. So in 10% of the 87 cases it was considered that blast lung played a considerable part in causing death and in another 10% a small part. The fact that these lung lesions are fairly common in battle casualties should, I think, be recognised, for their appearance is striking. In the early stages of the investigation when one was seeing the lungs soon after wounding, it seemed that they must play a considerable part in causing death, but later when one saw them days, weeks, and finally months afterwards, it was realised that although striking in appearance they had not as much clinical significance as was at first thought. The element of blast is almost certainly greater in this war than the last, yet Wiles (1944) reports that the mortality of battle casualties surviving long enough to reach general hospitals has dropped from between 6·1% and 10·4% in the last war to 2·1% in a series he studied in the MEF in the present war.

The question has been raised whether the bleeding may continue into these lungs after the initial brisk hæmorrhage. Hadfield and Christie (1941) are of the opinion that it may continue for 48 hours or so. In many of this series, though the cases did not come to post-mortem for some days after wounding, the hæmorrhages appeared fresh. For example—

CASE 29.—A co-driver in a tank was severely burnt on the face, legs, and arms and was subjected to blast when the ammunition box by his side blew up. He lived 37 days, and when the lungs were examined radiologically for the first time 30 days later the films showed the changes of blast. At autopsy the lungs were studded with hæmorrhages which looked remarkably fresh, though it is difficult to believe that he started to bleed again so long after he was wounded.

Nicholson and Scadding (1944) maintain that hæmothoraces do not clot probably because of the defibrinating action of the cardiac and respiratory movements. Possibly these have a similar effect in intra-alveolar hæmorrhage.

Wakeley (1943) says that in the more serious cases lobar pneumonia develops. We did not see this at all. In 4 of the moderate cases bronchopneumonia occurred, but in none of the severe ones. The earliest was case 17, at 112 hours, though Dr. Joan Ross found microscopic changes of bronchopneumonia in case 15 at 59 hours. This was the only case which did not have sulphadiazine early. It may be that this drug is a good prophylactic in blast lung, though it was given to prevent cranial not pulmonary sepsis.

SUMMARY

In a series of 87 autopsies on battle casualties, the majority penetrating head wounds, over a third were found to have "blast" changes in the lungs.

Continued at foot of next page

PRIMARY TUBERCULOUS INFECTION IN A SANATORIUM STAFF

INVESTIGATION AND SUPERVISION

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MBE, M B EDIN.
MEDICAL SUPERINTENDENT

A. CLARK PENMAN, M D GLASG.
DEPUTY MEDICAL SUPERINTENDENT

CHESHIRE JOINT SANATORIUM, MARKET DRAYTON

With RADIOLOGICAL INTERPRETATIONS *by*

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INTEREST has once more been focused on the incidence of tuberculous infection and disease in nurses by recent notices issued by the Ministries of Health and Labour, and by the interim report of the Prophit Survey (Daniels 1944), the first large-scale investigation into the problem in this country.

The work reported here belongs to an entirely different class. The tuberculin testing and other examinations of [illegible] ou[illegible] a[illegible] to[illegible] Th[illegible] inhabitants of a sanatorium is almost inevitable, progressive tuberculous disease can perhaps be avoided.

Methods and Classification

It can be confidently predicted that the age at which people get their primary tuberculous infection will come progressively later in this country, as open cases become fewer and better trained. It will therefore become quite impracticable to exclude non-reactors to tuberculin from work in tuberculosis sanatoria. This idea, which has been put forward by Snell (1945) and others, might be feasible at present in our larger cities; but for the average country institution, drawing its nurses and maids from rural districts and from Ireland, it is out of the question even now. We must employ the negative reactors and also look after them.

Progressive clinical tuberculosis must be preceded by primary [illegible] known of the inter[illegible] ve should have ear[illegible] We may then tak[illegible] progress of a primary which does not follow the normal course of uneventful retrogression. Brahdy (1940), dealing with primary tuberculosis in childhood, stated that "healing cannot be hastened by any form of therapy, and is not retarded even under unhygienic conditions." Even if he is correct there is no evidence to show that the same applies to young adults, and the satisfactory late histories of our infected nurses encourage us to believe that supervision at the time of infection is beneficial.

The routine examination of new staff includes: clinical examination; tuberculin testing; radiological examination; weighing; blood-sedimentation rate.

TUBERCULIN TESTING

The Mantoux test is repeated monthly in negative cases. We use the graduated intradermal test with purified protein derivative (PPD). [illegible] read after 48 hours. If neg[illegible] and if necessary a third inje[illegible] introduced the intermediate dose (0·0025 mg.) because we found the step from 0·0002 mg. to 0·005 mg. too large, and excessive reactions followed the latter in some cases. Reactions are classified as follows:—

+ 1 = induration 5–10 mm. diameter, irrespective of area of erythema.
+ 2 = induration 10–20 mm. diameter.
+ 3 = induration more than 20 mm. diameter.
+ 4 = induration with central necrosis.

Our minimum standard (+ 1) is the same as is now used by the Prophit Survey.

Ridehalgh (1942) reported reversion from Mantoux-positive to Mantoux-negative in 15 cases, but since the positive standard he [illegible] possible that some of [illegible] testing. We do not [illegible] they leave and rejoin. [illegible] after 6 months on th[illegible] returned 11 months after Mantoux-conversion and was [illegible] ter (having had [illegible] a positive. On [illegible] or a detectable [illegible] nd "primary" infection can occur, as Terplan (1940) has shown by pathological studies, and presumably it could only occur in the absence of tuberculin sensitivity. We have not encountered delayed tuberculin reactions such as were reported by Daniels (1943). It may be that PPD does not remain so long i[illegible]

Although the intensity [illegible] case we have made no att[illegible] clinical findings. Experience with the test in known tuberculous subjects led us to believe that the Mantoux test is a poor quantitative test in the individual case, though results of statistical significance may be obtained in a large-scale survey. Daniels found a higher proportion of "cases" among strong reactors than among weak reactors. It is possible that when the test is repeated monthly the interval between infection and test may be an important factor in the intensity of the reaction.

RADIOLOGY

T[illegible] an[illegible] Ma[illegible] exa[illegible] cian. The uneventful case usually goes on to half-yearly examinations 3 months after the positive reaction. When a primary complex in the lungs is visible we take radiograms at 3-monthly intervals, but we believe that in the absence of any clinical evidence of activity of the tuberculous process the observation of the regression of the primary is of academic interest only.

BLOOD-SEDIMENTATION RATE

The blood-sedimentation test is probably of more value in primary infection than at any other stage of pulmonary tuberculosis. We carry out the test monthly until the Mantoux reaction is positive and continue monthly tests for a minimum of 3 months. Thereafter it is repeated at each X-ray examination. In the uneventful case the sedimentation rate increases, sometimes very considerably, at the time the tuberculin reaction becomes positive. A month later it is back to the subject's normal level. When a case shows unsatisfactory retrogression of the primary complex, or is complicated by erythema nodosum, pleural effusion, or epituberculosis, the sedimentation rate remains rapid or returns slowly to its previous level. The normal sedimentation rate in apparently healthy women can be surprisingly rapid.

All our blood-sedimentation readings are taken at the second hour.

WEIGHT

Nurses and maids are weighed monthly, but weight charts have been of little value in the study of primary tuberculous infection. The great majority of the staff, especially the student nurses, put on weight rapidly during their first 6 months in the sanatorium. After

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Continued from previous page

I wish to thank Lieut.-Colonel P. B. Ascroft and Dr. Joan Ross for their interest, Major S. J. Johnson for his help with the post-mortem radiograms, and Col. G. T. Gimlette for permission to publish this article.

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that many of them lose for a few months until they arrive at a stable weight which is usually in excess of the weight on entry. The positive and negative reactors behave the same, and the occurrence of primary infection in the Mantoux-negative group does not disturb the weight curve (or curves).

When a member of the staff becomes Mantoux-positive she is radiographed (screening and radiogram), a blood-sedimentation test is carried out, and she is examined by a senior member of the medical staff. It has never been our practice to seek for the tubercle bacillus in these cases. If the findings were positive one would have no option but to notify the case, and the after-histories which appear later do not justify this course. If there were no disadvantages attached to being a notified case of pulmonary tuberculosis it might be different. As these cases would not reach the tuberculosis officer if they acquired their primary infection outside, we prefer to remain in ignorance of the possible presence of tubercle bacilli in their gastric contents.

At the clinical examination we explain again to the nurse or maid that 90% of town-dwellers go through a primary tuberculous infection at some time of their lives and know nothing about it, and that the same uneventful course is her own probable lot. At the same time we advise precautionary measures, depending on the clinical, radiological, and laboratory findings. Cases are treated individually on their merits, but may be divided roughly into four groups.

Group 1.—The symptomless with no radiological evidence of a primary complex in the lungs and no significant increase in the sedimentation-rate are advised to keep to a "work-and-bed" routine for a month and kept under observation for 3 months.

Group 2.—The symptomless with no gross enlargement of the hilar glands, but with increase in the sedimentation-rate are put on half duty and rest for a month. If at the end of the month the sedimentation-rate has returned to normal, and all else is well, they return to full duty.

Group 3.—The symptomless, with an enlarged gland or glands in the hilum with or without an obvious primary focus in the lung, and with increase in the sedimentation-rate are put to bed for a month. If the sedimentation-rate returns to normal and the gland is retrogressing they go on half duty and rest, and are usually on full duty in 3 months.

Group 4.—The clinically ill and those showing radiological lesions other than retrogressing primaries. These are treated for as long as necessary.

The system of investigation and control has grown up over a number of years from the time when an annual radiogram and a little sporadic tuberculin-testing was considered a go-ahead policy. It is not suggested that it is the last word on the subject, but rather that it is a minimum dictated by past experience. It has been in use since 1936.

Findings

New staff are classified on entry into three groups: tuberculous, Mantoux-positive, and Mantoux-negative (see table). The tuberculous group includes 2 hitherto unsuspected cases discovered at first examination, 1 of whom broke down with clinical tuberculosis during training.

CLASSIFICATION OF RESIDENT STAFF ENTERING 1936–43

On entry	Nursing	Domestic	Others	Total
Tuberculous ..	60	27	11	98
Mantoux-positive	97	68	5	170
Mantoux-negative	46	21	5	72
Total .	203	116	21	340

The Mantoux-negative entry, nearly 30% of the non-tuberculous, is considerably higher than in the Prophit Survey (19·2%) but much lower than most American figures. In one American institution (Myers et al. 1939) 84·2% of the entrants were non-reactors to tuberculin. Approximately 60% of our Mantoux-negative group were Irish, compared with 30% Irish among the Mantoux-positives. Of the 94 Irish entrants 45% were Mantoux-n

INCIDENCE OF TUBERCULOUS ILLNESS

Daniels (1944) deals at some length with the difficulty of defining a "case of tuberculosis." This would be easier if primary tuberculosis was differentiated from phthisis. A recent editorial in *Tubercle* (Sept./Oct., 1944) deals with this question. The difficulty is especially great in our small group because of the careful observation at the actual time of infection. While fully alive to the danger of our figures being misrepresented we have included every case which showed any symptom or sign (except elevation of the erythrocyte-sedimentation rate or an uncomplicated retrogressing primary complex) among the cases of clinical illness.

Tuberculous staff is an administrative worry, but the employment of ex-patients is an important part of rehabilitation. Their medical history is outside the scope of this paper.

There has been no case of tuberculosis among the 170 Mantoux-positive entrants during the 7 years under review. In the Prophit Survey 1·6% of the initially Mantoux-positives developed progressive tuberculosis or pleural effusion. Heimbeck's (1936) figure for a similar group was 4·3%. Edwards (1937) mentioned one case arising in 1935, but according to our present classification this nurse would have been considered tuberculous on entry. Her first radiogram showed an active and probably recent primary complex, and as this did not regress she was warded and then sent back to Ireland.

We are chiefly concerned with the fate of the 72 Mantoux-negative entrants. Mantoux-conversion followed in 50 cases. Of the rest, 21 left the staff while still Mantoux-negative, and one maid is still negative, 46 months after joining the staff. Two of the Mantoux-conversions left immediately after the positive test before X-ray or other examinations could be carried out. We are left with a Mantoux-conversion group numbering 48 (39 nurses, 7 domestic workers, 1 porter, and 1 laboratory boy). These have been divided into the clinical groups discussed above. Groups 1 and 2 are combined because regular serial blood-sedimentation tests were not carried out during the first few years of this survey.

Groups 1 and 2.—These two groups were made up of 33 symptomless cases without an obvious primary complex in the lungs at the time of the positive tuberculin test.

Group 3.—This group was made up of 5 symptomless cases with either a primary complex in the lungs or definite enlargement of a hilar gland. In every case steady retrogression of the complex could be followed in serial radiograms. Calcium was not visibly deposited in every case, but the hilar shadow usually subsided rapidly, and the parenchymal shadow became stable within 9 months.

Group 4.—These were 9 cases of primary or post-primary tuberculosis, and 1 symptomless case showing a lung lesion on the radiogram which is probably of reinfection type.

CASE-HISTORIES

CASE 2.—Aged 18, joined May 2, 1936. Mantoux-conversion in 6 weeks. At this time there was a primary complex in the left midzone and root. She developed erythema nodosum 10 days later with slight fever, and there were adventitiæ in the area of the lung component of the primary complex. The ESR rose to 76 mm. per 2 hours. The glandular component was smaller after a month in bed. She then went on sick-leave, but did not return to us. She is well and working in 1945 and has had no further tuberculous illness. In this case the sputum was cultured for *Mycobacterium tuberculosis*, with negative results.

CASE 3.—Aged 19, joined May 16, 1936. Mantoux-conversion in 3 months. At this time there was a doubtful primary lesion in the first left interspace. She complained of malaise and slight cough and spit which began a few days before the positive test. Dry pleurisy developed a month later. There were a few post-tussic crepitations over the area of the lesion. After 6 weeks in bed she was symptomless and went on sick-leave, from which she did not return to us. She is well and working in 1945 and has had no recurrence of tuberculous illness.

CASE 4.—Aged 24, joined June 14, 1936. Mantoux-conversion in 4 months. The information about this period is inadequate, but there is a normal radiogram 10 months after the positive test. A further 12 months later a left pleural effusion was discovered on routine examination. It was not accompanied by the customary rise in ESR. Questioning elicited the information that she was feeling slightly below par, but had no localising symptoms. She was warded for 4 months and had 1 month modified duty. The pleural shadow diminished in size very slowly. She completed her training and was well at the end of 1944 and has had no recurrence of tuberculous illness.

CASE 12.—Aged 18, joined Sept. 19, 1937. Mantoux-conversion in 3 months. At this time there was an enlarged gland in the left hilum, and the ESR rose from 6 mm. to 30 mm. Nine months later she developed an acute febrile illness after a stormy crossing from Ireland while suffering from a heavy cold. A left pleural effusion developed which cleared rapidly without aspiration. The hilar gland was not then visible. She was in bed for 3 months and had a further month of modified duty. There has been no recurrence of tuberculous illness, and she is well and working as ward sister in 1945.

CASE 13.—Aged 19, joined Sept. 16, 1937. Mantoux-conversion in 5 months. There was no definite change in the radiogram, but 5 days later she complained of slight malaise and spat a drop of blood once. The pulse-rate and temperature were irregular. There were fine and coarse râles in the left upper zone. The ESR rose from 18 mm. to 56 mm. and fell slowly. She was warded for over 2 months and on modified duty for a month. She is well and working in 1945 and there has been no recurrence of tuberculous illness.

CASE 23.—Aged 18, joined Nov. 2, 1938. Mantoux-conversion in 2 months. At this time there was a doubtful enlargement of the right root, but no definite lung lesion. She felt well and the ESR was not elevated above her rapid normal (35 mm.). Three months later the lung component of the primary complex was visible opposite the right second rib. She was put on modified duty. The lesion was larger

5 [illegible]

a [illegible]

g [illegible]

modified duty for 12 months altogether. The ESR did not reflect the alterations in size of the lesion. She completed her training and was well and working in 1944, and has had no recurrence of tuberculous illness.

CASE 27.—Aged 24, joined April 30, 1939. Mantoux-conversion in 5 weeks. At this time there was enlargement of the right root. Two weeks later she developed erythema nodosum and the temperature was irregular. The ESR rose from 16 to 43 mm. and fell slowly. She was put to bed for 3 months and had 3 months modified duty. She was well and married at the end of 1944 and has had no recurrence of tuberculous illness.

CASE 34.—Aged 21, joined May 26, 1940. Mantoux-conversion in 6 weeks. At this time there was enlargement of right hilar and paratracheal glands. A week later she complained of malaise, slight cough, and right-sided chest pain, and she was febrile. The right base was slightly dull and there were a few crepitations, possibly of pleural origin. The ESR rose from 10 to 36 mm. She was warded and had 8 months sanatorium treatment. During this time the radiogram showed impaired translucency of the right base and thickening of the lesser fissure. The ESR fluctuated, but eventually settled to normal. After a month of modified duty she returned to full duty. There was gradual diminution in the size of the glands over 2 years. She was well and working in 1944, without recurrence of tuberculous illness.

CASE 45.—Aged 16 when she joined as a pre-nursing pupil on Sept. 2, 1942. Mantoux-conversion in 15 months. At this time there was considerable enlargement of a left hilar gland and she was put to bed for a month. The ESR was slightly elevated above her high and irregular normal. Two months later she developed left pleurisy with effusion. She was febrile and the ESR rose to the heights one expects in this condition. She was in bed for 4 months and then went on sick-leave. A year after Mantoux-conversion the radiogram was almost clear, she was symptomless, and overweight, and returned to full duty.

CASE 47.—Aged 19, joined Sept. 1, 1943. Mantoux-conversion in 4 months. At this time there was no definite radiological change and she felt well. The ESR rose from 12 mm. to 25 mm. and returned to 14 mm. in a month. She was put on modified duty for a month. Since then she has remained well, but 9 months after Mantoux-conversion a small circumscribed opacity appeared at the left apex. The ESR rose again to 21 mm., which is within normal limits for a woman, but has returned to 13 mm. The lesion is contracting. It is considered that this lesion is of reinfection type.

Discussion

In the 7 years under review we have had 10 cases of primary or post-primary tuberculosis out of 48 originally tuberculin-negative entrants who were watched through their primary infection. This gives a rate of approximately 45 per 1000 observation years compared with the Prophit Survey rate of 18·8 and Heimbeck's (1936) figure of 152·0 per 1000 observation years. Both [illegible]

[illegible] of tuberculous illness.

[illegible]

The earliest manifestations were malaise and slight cough and sputum accompanying a lung primary. The symptoms appeared about 3 days before the positive reaction. Next came a small hæmoptysis from a primary lesion, 5 days after the positive test. Pleural involvement associated with a primary complex began a week after the positive. Erythema nodosum appeared at 10 days and 4 weeks. Increase in size of the primary lesion was noticed at 3 [illegible] sooner. Pleural effusion [illegible] at 2 months, 9 months [illegible] shadow of ?-reinfection type was detected 9 months after the positive test. In 7 cases the Mantoux reaction was positive 5–6 weeks after entry. The longest time is almost 4 years and still negative. The average is 4 months and 4·4 tests per case.

Radiological evidence of one or both components of the primary [illegible] infections. [illegible] of the positi[illegible] [illegible]eviously. It is absurd [illegible] small group, but this [illegible]uch higher proportion [illegible] Daniels (6·9%), Myers [illegible] (13·9%). The reason [illegible] of the film. In some cases the glandular enlargement was present for a short time only and would have been missed if Mantoux-testing and radiological examination had been carried out at yearly intervals. In others it was only possible to diagnose the glandular enlargement by comparison of serial radiograms.

SUMMARY

A scheme for the investigation and control of primary tuberculous infection in a sanat[illegible]

Of the non-tuberculous entr[illegible] of the sanatorium, 30% were t[illegible]

There was no case of tuberculosis among the tuberculin-positive entrants.

In 9 cases recovery from the primary infection was delayed or accompanied by clinical illness. All are now well without having developed progressive tuberculosis.

One case showed a symptomless apical lesion, probably of reinfection type.

We conclude that frequent tuberculin tests and serial radiograms are of value in the study of primary tuberculosis.

Our thanks are due to Mr. L. J. Cutbill, biochemist at the [illegible]

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BIOSYNTHESIS OF "NICOTINAMIDE" IN THE HUMAN GUT

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SINCE Theiler and his colleagues (1915) suggested that microbial synthesis of vitamins takes place in the rumen of the bovine, interest has been directed towards the rôle which intestinal micro-organisms play in the nutrition of animals and man. The discovery of the phenomenon of "refection"—i.e., the ability of the rat (Fridericia et al. 1927, Roscoe 1927) or the pigeon (Kon 1927) to remain unaffected by a vitamin-B_1-free diet, so long as this diet contains uncooked starch—was a further step in demonstrating bacterial synthesis of a vitamin in the gut. Apart from the ruminant, in which bacterial vitamin synthesis has been demonstrated by many workers (e.g. Goss 1943), hardly any progress was made until the introduction of the "sterilising" sulphonamides—sulphaguanidine and succinyl sulphathiazole—provided a new tool for investigations in this field. With this new technique the synthesis of a series of B vitamins (Daft et al. 1942, 1943a, Nielsen et al. 1944, West et al. 1943), of vitamin K (Black et al. 1942), and of vitamin E (Daft et al. 1943) has been shown to occur in the intestines of the rat.

Najjar and his colleagues (1943, 1944) have recently extended these investigations to man and have shown that aneurine and riboflavine can be produced by the intestinal flora. These in-vivo experiments are paralleled by studies on the metabolism of intestinal bacteria in vitro. Thus, Burkholder and McVeigh (1942) showed that six different intestinal bacteria produce, with few exceptions, riboflavine, aneurine, nicotinic acid, and biotin. When Ellinger and Coulson (1944) observed a considerable discrepancy between the measured elimination of nicotinamide methochloride and the calculated intake of nicotinamide in man they suggested a possible formation of nicotinamide by the intestinal flora. This observation induced us to investigate the possible contribution of the intestinal microflora to the nicotinamide requirement of man, a preliminary report of which has already been published (Ellinger, Coulson, and Benesch 1944).

METHODS

An investigation was carried out at West Park Hospital, Epsom, with 8 subjects, as follows:

Subject ..	A	B	C	D	E	F	G	H
Sex	F	F	M	M	M	F	M	M
Age (yr.) ..	66	44	56	32	33	43	57	30
Weight (kg.) ..	38·5	36	48	56	57	39	52	60
Diagnosis ..	CP	CP	PF	PF	PF	CP	PF	PF

F = female. M = male. CP = chronic pellagra.
PF = physically fit.

The experiment was divided into 3 periods of 7 days each. The first and third served as control periods. Diet and environmental conditions were kept as uniform as possible throughout the whole experiment. During the second period—the dosing period—sulphonamides were given to all subjects, who were divided into two groups. The first group, subjects A–E, received succinyl sulphathiazole, while subjects F–H received sulphathiazole as a control. It will be seen that group I included 3 fit persons and 2 pellagrins, while the control group consisted of 2 fit persons and 1 pellagrin. The dose of succinyl sulphathiazole used was that recommended by Poth and Knotts (1942)—i.e., 0·25 g. per kg. Subjects C, D, and E were therefore given an initial dose of 15 g. and then 2·5 g. every 4 hours for 7 days; C and D continued with the drug for 7 days but E refused to take more on the 3rd day. Subjects A and B were given 9 g. to start with and 9 g. daily in 6 equal doses. The sulphathiazole, which was administered to the control subjects F, G, and H, was doses of 3 g. daily in 6 equal doses after an initial dose of 1·5 g. Throughout the 3 periods the daily nicotinamide methochloride eliminations in the urine were estimated by the method of Coulson, Ellinger, and Holden (1944). In addition, the blood and urinary levels of sulphathiazole were determined on alternate days of the dosing period. This was done in the following way.

1. *In blood*—(*a*) *Free sulphathiazole:* 2 ml. of oxalated blood was laked with 32 ml. of saponin solution, and after 1–2 min. it was deproteinised with 6 ml. of 20% trichloracetic acid and filtered. To 10 ml. of the filtrate 1 ml. of 0·1 % $NaNO_2$ was added. After 3 minutes, 1 ml. of 0·5% ammonium sulphamate was added to destroy excess nitrite and after a further 2 minutes 1 ml. of 0·1% naphthylethylenediamine. The concentration of the coloured compound was determined with the aid of a Pulfrich photometer, and the blood level was obtained from a calibration curve.

(*b*) *Total sulphathiazole:* 10 ml. of the blood filtrate was heated with 0·5 ml. of 4N HCl on the boiling water bath for an hour, and after adjusting the volume to 10 ml. the estimation was completed as above.

2. *In urine.*—The same procedure as above was followed for the determination of free and acetylated sulphathiazole, except that dilutions of the urine were made in order to obtain concentrations suitable for estimation on the step-photometer.

At the end of the dosing period, 100 mg. test doses of nicotinamide were given by mouth to subjects B, C, E, F, G, and H, and subcutaneously to subjects A and D. This dose was repeated at the end of the 3rd period, except that those subjects who had received the dose by mouth on the first occasion had it injected subcutaneously and the rest were given an oral dose.

RESULTS

There was a considerable difference in the average daily elimination of nicotinamide methochloride during the two control periods between the healthy and the pellagrous subjects, the values being 5·43 mg. for the former and 2·53 mg. for the latter.

As can be seen from table I there was a pronounced decrease in the nicotinamide methochloride output in all subjects receiving succinyl sulphathiazole, amounting on the average to about 60%. It should be stressed, however, that all values reported are maximum values, and that values below 1 mg. per day can hardly be regarded as significant. It is also evident that the fall in the nicotinamide methochloride elimination varies from person to person, presumably with the degree of sterilisation of the intestines. In this connexion it is noteworthy that subject E, who showed the greatest and also most rapid drop in the nicotinamide methochloride output, very soon complained of abdominal discomfort, and consequently refused to continue with the experiment. Moreover, his stools very quickly became nearly odourless, which did not occur in the other subjects.

The control group on sulphathiazole showed no well-marked change in the daily nicotinamide methochloride elimination during the dosing period. This excludes the possibility of a direct interference of succinyl sulphathiazole with nicotinamide metabolism at the blood levels which occurred in these experiments, especially since the blood and urinary levels of sulphathiazole were always considerably greater in the control group than i the experimental group, as can be seen from table II.

The very low blood and urinary levels in the subject receiving succinyl sulphathiazole confirm the experienc of other workers (MRC War Memo 1943) that succin sulphathiazole is very poorly absorbed from the gut.

As has already been mentioned, 100 mg. test dose of nicotinamide were given to each subject—i.e., a the end of the 2nd and 3rd periods, once by mouth an once parenterally. The results are presented in table II Although the values in the two columns of this table ar not strictly comparable, because of the varied mode o administration of the nicotinamide on the two occasion it is nevertheless apparent that the responses to the tes dose were not impaired by the drugs given.

It can further be seen from table IV that there was n difference in the average response to the test dose in th 5 normal subjects, when the nicotinamide was given b mouth and when it was injected. The 3 pellagrins, o the other hand, gave a much lower response to the ora

TABLE I—AVERAGE DAILY ELIMINATION OF NICOTINAMIDE METHOCHLORIDE IN MG.

Group	Subject	Diagnosis	Period 1 (control)	Av.	Period 2 (dosing)		Av.	Period 3 (control)	Av.	Reduction in output on last day but one of period 2 as % of average output in period 1 †	Av.	Av.
I—Experimental Receiving succinyl sulphathiazole	A	Pellagra	2·56	*2·76*	0·97	(1·37–0)‡	*0·98*	2·19	*2·39*	100	*95·5*	*80·9*
	B	,,	2·96		0·99	(1·37–0·27)		2·59		91		
	C	Healthy	6·86	*5·88*	2·96	(4·18–2·19)	*2·26*	4·70	*4·91*	71	*71·0*	
	D	,,	4·57		2·53	(3·30–2·10)		4·68		53		
	E	,,	6·20		1·28*	(1·46–0·71)		5·38		89		
II—Control Receiving sulphathiazole	F	Pellagra	2·65	*2·65*	2·35	(2·84–2·06)	*2·35*	2·20	*2·20*	11	*11*	*4·7*
	G	Healthy	5·91	*5·15*	4·80	(5·22–4·20)	*4·51*	5·95	*5·83*	17	*3*	
	H	,,	4·39		4·22	(4·94–2·11)		6·20		–11		

The *averages* do not include the values on the 2 days when doses of nicotinamide were given.

* This value represents the average of only 4 days owing to the refusal of this subject to continue taking the drug.

† $\left(1-\frac{\text{output of pre-last day of period 2}}{\text{average output of period 1}}\right)\times 100.$

‡ The figures in parentheses represent the highest and lowest values encountered during the dosing period.

test dose, which suggests that absorption of the vitamin is interfered with in these subjects, a feature which has
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1937).

An
in table v. The response to the test dose is higher during the dosing period in all subjects given succinyl sulphathiazole, but the reverse is true of the control subjects given sulphathiazole. This diminished response in subjects receiving sulphathiazole might perhaps be due to a direct interference of sulphathiazole with nicotinamide netabolism, analogous to that observed by West (1941) nd by Schaefer, McKibbin, and Elvehjem (1943) for ulphapyridine, and recently also reported to occur with ulphathiazole by Krehl and Elvehjem (1944), who found hat the curative effect of nicotinic acid on dogs deficient n nicotinic acid was impaired by these sulphonamides. This interference would, of course, be absent in the ubjects who received succinyl sulphathiazole, since only egligible amounts of sulphathiazole were circulating in heir blood-stream.

TABLE II—AVERAGE TOTAL, FREE, AND ACETYLATED SULPHATHIAZOLE LEVELS DURING THE DOSING PERIOD

Blood levels mg. per 100 ml.				*Urinary levels* mg. per 24 hr.			
Group	Total	Free	Acet.	Group	Total	Free	Acet.
I	0·80	0·62	0·18	I	457·2	162·9 (156·0)	294·3
II	2·95	2·45	0·50	II	1344·0	1082·0 (1039·0)	262·0

TABLE III—ELIMINATION OF NICOTINAMIDE METHOCHLORIDE IN MG. PER 24 HR. AFTER A 100 MG. TEST DOSE OF NICOTINAMIDE

Subject	Given on last day of—			
	Period 2		Period 3	
	Route	Elimn	Route	Elimn
A	Parenteral	13·82	Oral	8·45
B	Oral	5·18	Parenteral	11.40
C	Oral	15·50	Parenteral	9·46
D	Parenteral	16·62	Oral	9·70
E	Oral	18·25	Parenteral	8·70
F	Oral	3·06	Parenteral	7·76
G	Oral	12·45	Parenteral	9·08
H	Oral	8·73	Parenteral	16·70
Average ..	..	.. *11·70*	.. ..	.. *10·16*

DISCUSSION

The definite reduction in the urinary elimination of nicotinamide methochloride during the administration of succinyl sulphathiazole is most readily explained by assuming that the intestinal flora normally synthesises and releases nicotinamide, and that this process is impaired by the bacteriostatic action of the drugs. It is improbable that the drop in nicotinamide methochloride elimination could have been due to an increased utilisa-

itself, since more sulpha-
blood of the subjects
showed only a small
decrease in nicotinamide methochloride output, than in

y
e

succinyl sulphathiazole regime, since a large proportion of the test dose would already be absorbed from the stomach. Absorption from the stomach is evident from Ellinger and Coulson's (1944) observations that nicotinamide methochloride is eliminated in increased amounts almost immediately after the oral ingestion of nicotinamide. The sulphathiazole liberated in the intestines from succinyl sulphathiazole is unlikely to interfere with the absorption of nicotinamide, since some of the orally administered sulphathiazole reaches the lower intestine, and is absorbed there, without interfering considerably with the nicotinamide absorption as shown in the control

TABLE IV—AVERAGE ELIMINATION OF NICOTINAMIDE METHOCHLORIDE IN MG. DURING THE 24 HR. FOLLOWING A 100 MG. TEST DOSE OF NICOTINAMIDE

—	Given orally	Given parenterally
Healthy subjects C, D, E, G, H	12·93	12·11
Pellagrins .. A, B, F..	5·56	10·99

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chloride output in the control subjects during sulpha-

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TABLE V—AVERAGE ELIMINATION OF NICOTINAMIDE METHOCHLORIDE IN MG. DURING THE 24 HR. FOLLOWING A 100 MG. TEST DOSE OF NICOTINAMIDE

Group	Given on last day of—	
	Period 2	Period 3
I—Succinyl sulphathiazole ..	13·87	9·54
II—Sulphathiazole	8·08	11·18

If th
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thesis and release of nicotinamide could account for the discrepancy between the dietary intake of nicotinamide, and the elimina
ethochloride
referred to at the
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explain the findin
Gue (1944)

that in men fasting for 4 days the urinary elimination of acid hydrolysable nicotinic acid plus nicotinamide methochloride was not significantly diminished. Furthermore, it appears from the values obtained that this biosynthesised material contributes a substantial part of the nicotinamide requirement.

In this paper the nicotinic acid derivative responsible for the nicotinamide methochloride eliminated in the urine has been called "nicotinamide." Since the same nicotinamide methochloride is formed in the animal body from ingested nicotinic acid and nicotinamide (Ellinger 1945) the substance released by the intestinal flora might just as well be nicotinic acid or even a precursor of nicotinic acid (Krehl and Strong 1944, Krehl, Elvehjem, and Strong 1944).

The implications of these investigations for the conception and ætiology of nicotinamide deficiencies, particularly pellagra, have been discussed elsewhere (Ellinger, Coulson, and Benesch 1944); some of these points were also dealt with in a recent leading article (*Lancet* 1944).

As will be shown in the addendum, bacterial counts of the stools before and during the administration of succinyl sulphathiazole or sulphathiazole showed no decline in the *total* number of bacteria during dosage. This is in agreement with the observations on rats by Gant, Ransone, McCoy, and Elvehjem (1944), who found after the ingestion of "sterilising" drugs a decrease of the coli groups and a complementary increase of other bacteria, the total bacterial counts remaining constant.

SUMMARY

The urinary nicotinamide methochloride elimination was determined in 8 persons before, during, and after the administration of succinyl sulphathiazole in 5 cases and of sulphathiazole in 3 cases. Succinyl sulphathiazole diminished the urinary nicotinamide methochloride output on the average by 60%, while sulphathiazole caused only a small reduction. This is interpreted as demonstrating a biosynthesis of nicotinamide in the gut.

Succinyl sulphathiazole does not interfere with the methylation of ingested nicotinamide.

The daily output of nicotinamide methochloride was found to be considerably lower in the 3 pellagrins than in the 5 normal persons.

While no well-marked difference in absorption of nicotinamide from the intestinal tract and subcutaneous tissues can be observed in normal persons, absorption from the intestinal tract was found severely impaired in the 3 pellagrins.

We are indebted to Dr. W. A. Caldwell for permission to carry out the investigation at West Park Hospital, Epsom, and to Dr. S. W. Hardwick for the clinical care of the subjects under investigation. One of the authors (P. E.) acknowledges with thanks a grant for technical assistance from the Ella Sach Plotz Foundation, Boston, Mass.

Addendum

BACTERIAL COUNTS ON THE FÆCES

The basis of reference was the number of organisms per ml. of solid fæcal matter, as estimated from the number of colonies produced in agar pour-plates by 1 ml. of a standard dilution of the stool (Poth and Knotts 1942).

The whole freshly poured stool was well mixed, and a portion, estimated to yield approximately 1 ml. of solid after centrifuging, was mixed to give a good suspension with sufficient sterile physiological saline to give 10 ml. of suspension. From this, 1 ml. was taken for serial dilution and the remainder centrifuged under standard conditions to determine the volume of fæcal solid. From the serial dilutions, volumes of 1 ml. were taken to set up nutrient agar pour-plates, which were incubated at 37° C. Total colony counts were made at 24 and 48 hours and repeated later if necessary to avoid errors due to slow growth of the small deeper colonies. Counts were made on stools collected at the end of the control and test periods.

The effect of the sulphonamide treatment on the intestinal flora was difficult to assess by the bacteriological methods used, especially since differential counts were not done. In spite of large individual variations in the bacterial counts, both before and during dosage, in no case was there a significant decrease in the total count during the dosing period, while in some cases there were actual increases.

References at foot of next column

POSTOPERATIVE CUTANEOUS GANGRENE

EFFECT OF PENICILLIN

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THE condition of which two examples are described below may be defined as a slowly progressive postoperative gangrene of the skin and subcutaneous tissues due to micro-aerophilic streptococci. It is not widely known in this country, though there is a striking clinical picture with characteristic bacteriological findings and a certain cure. Cases are being reported with increasing frequency in America and elsewhere abroad.

Hamilton Bailey (1940) roughly describes the lesion without mentioning the bacteriological findings, and says it "seems to be a clinical entity." Romanis and Mitchiner (1941) give a brief but exact account of the condition, but Julian Taylor (1940) says it is due to anaerobic organisms *or* the streptococcus, that it is usually seen in patients debilitated by alcoholism or exhausting disease, thus implying that it is the patient's resistance rather than the nature of the infection that is the responsible factor, and that treatment is often ineffective. An excellent description is given by Meleney, to whom much of our knowledge of the condition is due, in Christopher's *Textbook of Surgery* (1939) under the title of postoperative progressive bacterial synergistic gangrene.

CASE-REPORTS

CASE 1.—A man, aged 54, was admitted to Hope Hospital with a perforated duodenal ulcer of 17 hours' duration on Sept. 19, 1942. Though he had suffered with indigestion for many years he had had no other illnesses of note and his general condition was good. The operation was performed under local anæsthesia with the addition of gas and oxygen, the approach being through a right paramedian incision splitting the rectus muscle. A small perforation of the anterior duodenal wall was closed with two catgut mattress sutures; there was little peritoneal spill, and the wound was closed with continuous catgut to the deeper layers and interrupted sutures to the skin; contrary to our usual practice, two tension sutures were inserted.

The patient's temperature was unsettled in the first week, at the end of which time there was a thin purulent discharge from the wound. A few days later the wound was widely gaping and a deep angry induration had appeared at the site

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of the tension sutures. For 12 weeks thereafter there was a slowly progressive cutaneous and subcutaneous gangrene, with a tender angry margin and an inoffensive but free purulent discharge from the edges and islands of sloughing skin. At no time was muscle or aponeurosis invaded. A striking feature was the absence of deterioration in the patient's general condition. The hæmoglobin fell to 65% (Haldane) only after further operative interference, otherwise remaining at 75% without the administration of iron. At the end of the 12 weeks the ulceration extended from below and to the left of the umbilicus, over the right side of the abdomen deeply into the flank and over the chest wall, exposing an inch of rib beneath the right nipple (see figure).

Prof. E. D. Telford saw the case and recommended that the area should be excised with the diathermy cautery and the wound edge carbolised. This was done on Jan. 13, 1943, cauterisation being taken down to the muscle or deep fascial plane half an inch outside the inflamed margin. The subcutaneous tissue was œdematous even at this distance from the wound edge. A portion of the wound to the left of the umbilicus which did not appear to be seriously invaded was cauterised. Within a few days it was obvious that extension of the ulceration had ceased and that epithelialisation was commencing both at the line of cautery and from small islands of epithelium left in the ulcerated area. At the edge of the wound not treated by cautery however ulceration extended, and this area of the wound was cauterised a few weeks later.

I [illegible] 0 white cells (70 [illegible] polymorphs); the [illegible] and insulin therapy. One and two weeks after cauterisation figures almost identical with the first count were obtained in spite of [illegible] healed [illegible] the [illegible] ions requiring dressing.

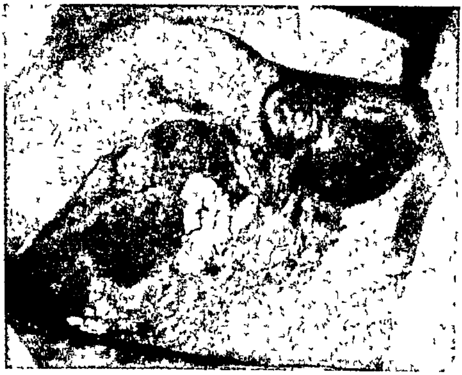
The patient's vitamin-C excretion was normal, his blood-sugar 105 mg. per 100 c.cm, and his Wassermann reaction negative. Of the local applications used, continuous moist dressings of 1/1000 proflavine were by far the most satisfactory. Sulphonamides administered locally and by mouth had no effect. Penicillin was not obtainable. A local applica- [illegible] by Meleney, was [illegible] ing an active [illegible] ch a large area was both difficult and painful, nor did we at any time see benefit from its use.

Bacteriology.—Swabs of the purulent exudate were taken at random from the wound where the exudate was most profuse. On the first three occasions only streptococci were seen in the film of the pus, and culture gave a pure growth of streptococci anaerobically. In the last film, examined 2 months after the original one, staphylococci and streptococci were present and culture gave a growth of staphylococci aerobically and streptococci and staphylococci anaerobically. The streptococcus grew anaerobically on a blood-agar plate and was non-hæmolytic. It grew aerobically on one occasion in broth and on subsequent subculture on blood-agar. The staphylococcus was of an aureus type, coagulase-positive. Unfortunately no note was taken of the situation in the wound from which cultures were taken, but the first three cultures taken over a period of 5 weeks yielded only streptococci.

CASE 2.—A man, aged 62 years. This was a less typical case clinically, being of slower onset and development. It again followed operation for a perforated duodenal ulcer in which tension sutures were employed. The wound appeared to heal satisfactorily at first and the patient's general condition was good, but on the 11th day an infected hæmatoma in the wound had to be evacuated. On the 13th day a temperature of 100° F was recorded and this persisted in spite of sulphonamides. A subphrenic abscess on the right side was suspected as the cause but the region was explored on the 26th day without success except that the temperature remained settled for 10 days thereafter. The wound meanwhile was slightly inflamed, tender, and indurated. The temperature then started swinging again, and on the 46th day the now obviously extending painful inflammatory induration around the wound, with one or two angry areas of ulceration, attracted our attention and led one of us to suspect the nature of [illegible]

pus was cultured directly on to a blood-agar plate, but much [illegible]. Growth in broth was scanty [illegible] anaerobically. A routine peni- [illegible] plate was made by inoculation of the pus and spreading it over the medium. The organisms were found to be sensitive to one drop of penicillin solution of a strength of 10 units per c cm. and one drop of penicillin solution of a strength of 1 unit per c.cm. No staphylococci were seen in films of the pus and none grew in the cultures.

Treatment with penicillin.—Since the patient was still pyrexial and this had not been a feature of the previous case, it was believed that the wound might not be the cause of the temperature, but the man's condition was rapidly deteriorating and it was decided to try a course of penicillin. [illegible]



Appearance of abdominal and chest wall 12 weeks after operation for perforated duodenal ulcer.

from the 2nd day the inflammation, induration, œdema, and pain round the wound resolved, and the wound healed in a few days without recurrence of infection. The patient's [illegible]

DISCUSSION

This first case, possibly the tenth described in this country, presents the classical features of the condition— [illegible]

treatment and local applications with a rapid response to excision of the wound edges by cautery or scalpel. Dressings and general treatment do not seem to be of any importance; excision and excision alone should be taken as curative in the absence of penicillin. Spontaneous cures have been reported by Meleney (1935), and Wakeley and Willway (1937), the latter presenting a case which clinically undoubtedly belongs to the type under discussion though no bacterial evidence is presented.

Nearly all described cases follow operations for thoracic [illegible] or perforated peptic ulcer, [illegible] of gut, all of which are [illegible] o a heavy mixed wound infection. Cases appear to have been described first as a clinical entity by Cullen and Christopher separately in 1924 and by Brewer and Meleney together in 1926 in America, the latter then demonstrating what he believed to be the nature of the infection. In 1931 Meleney wrote confirming his findings and Willard in 1936 believed himself to be the first person to confirm Meleney's work, but Nightingale and Bowden (1934) in this country probably have the right to that distinction. Hector Scotson (1933) described the first case in this country, Nightingale and Bowden (1934) the next. In 1935 Stewart Wallace described a further case following empyema drainage and gave an excellent account of the 37 reported cases he could then collect, 30 of them being from America. In the same year Blaxland cited 2 cases from his own experience, one having occurred sixteen years previously. Cox in 1936 briefly described what he believed to be the fourth case in Britain though it appears that 5 cases had already been described. Callum and Duff (1941) described 2 cases which must be accepted as examples of this clinical condition. The first, following appendicectomy, died 21 days after operation which is most unusual, and in the second the gangrene appeared after recurrent abscesses at the site of an old empyema scar, also a hitherto unreported feature. They suggest the title "wound phagedæna" which seems unnecessary since "progressive postoperative cutaneous gangrene" is accurate and established in usage. Callum and Duff have the impression that the mortality is about 50%. Surely this is much too high a figure? With the exception of the rare fulminating case such as they describe there seems to be no reason for anything but a small mortality, for the condition is open to early recognition and ready cure, provided an early bacteriological examination of the pus from a suppurating wound is insisted on.

A non-hæmolytic streptococcus and *B. proteus* were the significant organisms in the cases described by Callum and Duff. From other bacteriological findings in this condition and from the known habits of *B. proteus* it seems possible that this organism was a secondary contaminant, though there is some evidence that streptococci facilitate the action of *B. proteus.* A micro-aerophilic streptococcus has always been found in progressive postoperative cutaneous [illegible] staphylococci, diphtheroids, *B. proteus*, [illegible] isms are inconstantly found. If any synergistic action is operative it must exist between the micro-aerophilic streptococcus and a variety of organisms. Willard (1936) reports a case in which non-hæmolytic streptococci were cultured from the margin of the wound but the centre of the wound gave a growth of hæmolytic streptococci. Nightingale and Bowden (1934) found non-hæmolytic streptococci and staphylococci but did not state the situation of the wound examined. Meleney's cases grew non-hæmolytic streptococci from the margin of the wound and staphylococci and non-hæmolytic streptococci from the gangrenous portions, and he put forward a view, based on experimental inoculation of mixed cultures into the abdominal wall of dogs, that the gangrene is produced by the action of one organism on some product of metabolism produced by the other. Further work on this point would be of interest. Our findings suggest that the streptococcus is the primary cause of the condition.

SUMMARY

Two cases of postoperative cutaneous bacterial gangrene are reported, one successfully treated by excision of the margins by electro-cautery and one by a systemic course of penicillin.

Thanks are due to Professor Telford for his advice in the first case and to Mr. G. Brown, medical superintendent, Hope Hospital, for permission to publish the records.

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Reviews of Books

Whooping Cough

J. H. LAPIN, B CHEM, MD, adjunct pediatrician, Bronx Hospital, New York. (Baillière. Pp. 238. 25*s.*)

A MONOGRAPH on whooping-cough is a sign of the times. In the past two decades there has been a great quickening of interest in this distressing infection which today causes more invalidity and deaths among young children than any other specific fever. The Danish work on bacteriological diagnosis, Leslie and Gardner's demonstration of the different phases of *Hæmophilus pertussis*, and the recent work of Sauer and others in America on prophylactic vaccination have stimulated research; and Dr. Lapin, himself a clinician with considerable experience of the disease, has written an up-to-date review of the whole subject. He shows, from analysis of vital statistics, how severe an infection is pertussis; he reviews the convincing evidence in favour of *H. pertussis* as the sole ætiological agent; he describes in detail the pathological changes in the lungs, and is dubious about a neurotoxin in explanation of the cerebral lesions found after death from convulsions; he deals fully with recent immunological researches and the significance of the pertussis "endotoxin," and he discusses the value of different serological tests—complement-fixation, agglutination, opsonocytophagic tests, protective antibody and intradermal reactions—in their relation to diagnosis and immunity. The clinical phenomena are understandingly described but blood changes get perhaps less space than they deserve. There is a good chapter on X-ray appearances in the lung, which the author interprets as indicative of obstructive emphysema and atelectasis due to the plugging of the bronchioles with viscid sputum: secondary pneumonitis may develop in the collapsed areas with associated pyrexia. The recent field work on prophylactic vaccination is critically analysed, and Dr. Lapin reaches the final verdict that it is worth doing. There are chapters on the less well-known uses of convalescent and hyperimmune serum in the protection of exposed children and for early treatment, chapters on non-specific treatment of the di[illegible] and its complications, and lastly a brief but careful summary of public health measures for the better control of pertussis. This is a useful book on a most important subject.

Mitosis

FRANZ SCHRADER, professor of zoology, Columbia University. (Oxford University Press. Pp. 110. 13*s.* 6*d.*)

L. Geitler's little monograph on chromosome structure, published in German shortly before the war, was an adequate review of the morphology of the chromosome body; the present monograph deals with the mechanism of nuclear division. Professor Schrader has for many years studied various anomalous types of mitosis and meiosis in insects, and he writes with mature judgment. Though his method is that of a morphologist rather than an experimenter, his main interest is in the physiology of mitosis. He discusses those uncertain structures, the spindle fibres, and concludes that they do exist in life. He recognises continuous fibres, extending from pole to pole, chromosomal fibres connecting the chromosomes to the poles, and interzonal connexions stretched between the chromosomes at anaphase. In the second part he deals with hypotheses of mitotic movements, the resting stage, the pairing of chromosomes, and the relation of the nuclear membrane to the chromosomes. Professor Schrader obviously considered mitosis in cancerous tissues outside the scope of his discussion; nevertheless, workers on cancer cytology will find here much that bears on their work.

Social Work for the Tuberculous

A practical guide. HARLEY WILLIAMS, MD, IRENE HARBERT. (NAPT. Pp. 152. 5*s.*)

THIS is a competent guide for health visitors, almoners, and social workers, dealing concisely with the practical problems of every tuberculosis service under such headings as types of disease, the patient in the home, mass radiography, treatment allowances, general care in the sanatorium, after discharge, rehabilitation, and health education. The authors have made their information as up to date as possible, giving details of the scheme of financial allowances, outlining the white-paper on social insurance, and discussing future schemes of reablement. Such a useful handbook deserved a more durable cover.

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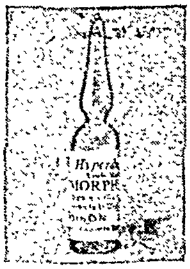

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THE LANCET

LONDON: SATURDAY, APRIL 7, 1945

The Anatomy of Research

"His theme is that faculty of the human mind which expresses itself in research, chiefly scientific and medical. Among its motives he ranks primal curiosity first, with desire for increased power over men and things a close second. The motives are mixed: 'I wonder why . . . or how . . . this happens,' is the dominant question in 'fundamental' research; 'I wonder how we can do such-and-such,' is the urge in 'applied' research. But the two can alternate and overlap. Among the minds of researchers he distinguishes the patient plodders, the impatient drivers (brilliant but careless), the versatile yet inconclusive dilettantes, the fanatical cultivators of single fields, and the occasional uprising genius who seems to have the virtues of them all. He illustrates his anatomy with sketches of many well-known figures in research today, of whose lives and work he seems to have an intimate knowledge. He has many inner stories of the birth of new ideas, now well known as recent advances, but curiously chancy in their origins. In sum, he gives a fascinating picture of a faculty as varied in its associations, as rich in its possibilities, and as unpredictable in its achievements, as those that express themselves in art or music or poetry."

WE venture to quote this unpublished review, of a book that is not yet written, in the hope that someone will write the book, and that the keepers of the purse-strings of research will read it.

When the State inaugurated National Health Insurance in 1911, it set up, as a logical accessory, a Medical Research Committee under the National Health Insurance Joint Commission to administer funds provided by the Act, presumably with the immediate object of reducing sickness and saving money. In 1919 the financial link with health insurance was broken, and the new Medical Research Council, financed from the Treasury and responsible to the Privy Council, came to enjoy almost complete freedom in determining its policy and disbursing its money. Its record is widely acclaimed as successful, though of course nobody knows what good opportunities it may have missed. When the National Health Insurance Act is superseded by a National Health Service, the logically-minded may again suggest that the Service should sponsor research, this time in a big way. If so it is to be hoped that the Medical Research Council will jealously guard its present freedom from departmental control; already in 1938 its secretary was uneasy[1] at the pressure of requests for investigations from various Government departments. The Council has hitherto divided its support between "fundamental" and "applied" research; since departmental pressure is almost always on behalf of the latter, too much of it would disturb the balance. Applied research is already, in the nature of things, the kind of research that interests industry, and on which industry is spending increasing sums, to good advantage.

It is further to be hoped that, welcome though an expansion of the Medical Research Council's funds and activities will be, the expansion will not come near to giving it a monopoly. It must have the power to instigate and to finance large investigations, requiring teams of workers, for many present problems no doubt require them; but it should not become so powerful that no researcher can hope for a fair chance without its support. Eminent though its eight scientific members are, and limited though their individual term of office is, they cannot be all-wise, and the safeguards against their becoming, even unwillingly, the dictators of research cannot be too strong. The strongest safeguard is independent competition, of which the springs are the private endowments and the research funds of the universities. The universities in particular have the chief responsibility for fundamental research. They should provide the atmosphere where scientific curiosity can pursue its bent, however remote that may appear to be from immediate utility, and they are the sphere where research of all kinds—brilliant or pedestrian, fundamental or applied—exerts its educative influence upon the teachers and the taught.

Money cannot buy research; it can only provide soil and climate suitable for its growth. A wide variety of soils and climates is needed, and that is best provided by money from a wide variety of sources

The Staphylococcal Carrier

THE most common bacterial pathogen found in wounds, whether sustained on the battle-field, in the factory, or otherwise in civilian life, is *Staphylococcus aureus*. Although ranked second in importance to the streptococcus, it has been the cause of much severe infection and chronic invalidity among the war-wounded, particularly where it has infected bone. Its apparent ubiquity likewise makes it the principal cause of the wound sepsis that often follows minor injuries in factories, sometimes leading to serious disability, although in future penicillin should prove a powerful ally to the factory doctor in preventing such disablement.[1] The staphylococcus is also a common invader of the maternity unit, causing mastitis and sepsis of the genital tract in the mother, and spreading round the nursery in many guises—conjunctivitis, furunculosis, pemphigus, pneumonia, and other deep-seated infections which may not be easily recognised.[2] In any attempt to control the spread of infection, it is necessary to know the reservoirs of the infecting organism and the channels by which it spreads from one person to another. Considerable progress has already been made in tracing the mode of spread of streptococcal infection, largely by the use of new bacteriological methods, such as Lancefield grouping and Griffith typing, that disclose more precisely the identity of individual strains. In the case of the staphylococcus progress along these lines is only now beginning. The coagulase test, the rationale and anomalies of which have lately been explained,[3] is now generally accepted as an easy test of potential pathogenicity, although the "virulence" of strains is probably more closely related to toxigenicity, which is less easily estimated. KNOTT and BLAIKLEY[4] have attempted to grade the virulence of staphylococci, basing their assessment on a summation of activities—pigment production, coagulase and hæmolytic activity, liquefaction of gelatin, fermentation of, mannitol—and have found that exclusion of carriers of the more "active" strains (grades A and B) from the maternity unit has been accompanied by a striking diminution in staphylococcal sepsis. But where are the reservoirs and how common is the staphylococcal carrier?

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[1] Mellanby, E. *Lancet*, 1938, ii, 929.

[1] Florey, M. E., Williams, R. E. O. *Lancet*, 1944, i, 73.
[2] Cass, J. M. *Arch. Dis. Child.* 1940, 15, 55.
[3] Smith, W., Hale, J. H. *Brit. J. exp. Path.* 1944, 25, 101.
[4] Knott, F. A., Blaikley, J. B. *J. Obstet. Gynæc.* 1944, 51, 386.

Different investigations have shown that 30–50% of adults carry coagulase-positive staphylococci in their anterior nares, and about 20% carry similar staphylococci on their skin. These studies have been done mostly on nurses and students living in a hospital environment, but MILES, WILLIAMS, and CLAYTON-COOPER[5] have found rates of 47% nasal carriers and 18% skin carriers in a sample of the general population examined at the outpatient department of the Birmingham Accident Hospital. They found rather higher nasal carrier-rates among *inpatients* (54·5%) and nurses (64%), suggesting that some people become carriers from more intimate exposure to an infected environment. When steps were taken to discover the permanence of the staphylococcal nasal carrier by weekly swabbing of inpatients and nurses for periods up to 10 weeks or more, it appeared that some 20–30% of adults are persistent carriers, that a similar proportion are persistently negative, and that there is nearly a 3 to 1 chance that an individual who is found to be a staphylococcal nasal carrier at the time of first examination was a carrier during the previous 7–14 days. This last point is important in assessing the likelihood of established wound-sepsis being an *autogenous infection*. As it happened, only half of the patients admitted to hospital with staphylococcal infection were nasal carriers, and other data indicated that a good deal of such infection is exogenous.

We therefore need reliable methods for tracing the source of the infecting staphylococcus. Serological typing has not made much progress since COWAN[6] described three types and a number of subtypes. More promising is the phage typing of FISK,[7] who by a relatively simple technique has applied this differential test to demonstrate the identity of nasal and wound strains. FISK and MORDVIN[8] have further shown that phage typing is superior to tests of the production of coagulase, pigment, or hæmolysis for identifying strains and tracing sources of infection. They found that the same phage type was present in the nose of one person over a period of three years, but in two other people different phage types were recovered at intervals of one and two years; the strain isolated from an infected lesion was not invariably the same as the patient's nasal strain. This method of typing staphylococci, as MILES and his colleagues indicate, has already been adopted in this country, and we may soon hear more of its use in tracing the spread of the staphylococcus. Meanwhile, although it is impracticable to exclude all nasal and skin carriers from surgical and maternity units where they are likely to be most dangerous, the identification of these carriers, particularly skin carriers,[9] is worth while if it impresses on them the need for taking the sensible precautions detailed in MRC War Memo No. 6, to minimise the risk of transferring infection. The no-touch dressing technique has been successfully applied by MCKISSOCK and his colleagues[10] in the control of war-wound cross-infection, and now the team at the Birmingham Accident Hospital[11] report encouraging results from its adoption in the dressing of factory injuries; during a test period of 184 days (compared with a preliminary control period of 70 days) the incidence of both streptococcal and staphylococcal "added" infection was [illegible] By following their example [illegible] the country could show similar reductions in this commonest form of ward sepsis.

Where People Live

A CENTURY has passed since the public conscience was stirred by reports on the degrading and filthy conditions existing in town and countryside. Britain was then leading the world in an industrial revolution, but many of her men, women, and children were slaves to the new machines. Today, a hundred years later, we see our own and other nations tied to the machine of war. But at least we understand now that the greatness of a people does not really lie in its wealth, or its output of guns, but in the lives of its citizens. We know now that our aim must eventually be to make everybody free from all kinds of fetters—from political tyranny, from economic bondage, from poverty, from ignorance, and from avoidable disease. The medical profession certainly can never be content with inequality of health between rich and poor, and whatever influence it possesses or can secure should be used unceasingly to obtain for everybody the decent conditions on which health depends.

Probably the greatest drain on the health of our nation is its housing. Houses that were already slums soon after they were built, more than a hundred years ago, have become worse slums. Families are dirty because their environment is dirty, because there are many towns in which less than half the houses have baths. To escape from dreariness and squalor they spend their few spare sixpences on "flicks," "fags," dances, and in peace-time on the pools. Drunkenness has decreased, but prostitution and casual intercourse are a graver evil than ever. Some blame for the decline in sexual restraint may be laid against the unsettlement of war, some against lack of education, but most perhaps against life in the little-ease of a small and overcrowded room. Here the father eats his meal after coming home from work, and perhaps even tubs in front of the fire; here the mother struggles to put squealing children to bed; here the adolescent tries to do homework or escape into a romantic book; and here boys and their girl friends find every reason to go out. Legions of small children never get the habit of cleaning their teeth because the scullery tap (cold) is the fount at which all the family wash, and around it the breakfast is cooked and eaten.

Whatever government is in power after the war, housing will be its first and biggest home problem; and if this is tackled in the proper way the replacement of houses destroyed in the blitz will only be a small part of a larger programme for the abolition of slums. Sir ERNEST SIMON estimates that, of the

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[5] Miles, A. A., Williams, R. E. O., Clayton-Cooper, B. *J. Path. Bact.* 1944, 56, 513.
[6] Cowan, S. T. *Ibid*, 1939, 48, 169.
[7] Fisk, R. T. *J. infect. Dis.* 1942, 71, 153, 161.
[8] Fisk, R. T., Mordvin, O. E. *Amer. J. Hyg.* 1944, 40, 232.
[9] Devenish, E. A., Miles, A. A. *Lancet*, 1939, i, 1088.
[10] McKissock, W., Wright, J., Miles, A. A. *Brit. med. J.* 1941, ii, 375.
[11] Williams, R. E. O., Clayton-Cooper, B., Howat, T. W., Miles, A. A. *Brit. J. Surg.* 1945, 32, 425.

12½ million houses in Great Britain, a third are, judged by modern standards slum houses. The House of Commons debate, reported on another page, reflects the feeling that really drastic action is needed to prevent a social disaster when the troops come home: as Dr. GARLAND puts it, in the paper we publish this week, an effort is needed comparable to that required to win the war. The operative word is "win." The current habit of describing civil problems in military terms seems to ignore the fact that military operations are not always as successful as those of the past fortnight. At the moment the housing campaign bears none of the promise of victory. The hopes that factories engaged in making aircraft could soon be spared for equipping homes have proved ill founded. The Portal house, though a tight fit for any normally untidy household, was at least a promising social experiment offering the housewife an easily cleaned home, a well-appointed kitchen, a bath, and a place to put the pram. Temporarily lacking the means to manufacture this type, the Government has been considering other forms of prefabricated bungalow; but the cost of these is high for a temporary house. Perhaps their cost could be diminished by limiting equipment to necessities, and dispensing with the luxury of a refrigerator apiece; but in any case they are too extravagant in manpower to serve our present need, for only three of them can be erected in the time it takes to put up ten Portal bungalows. Accordingly the Government is now veering again towards permanent houses as the ultimate solution; and this of course they are. But nobody can pretend they are a quick one. Nor must they follow the graceless patterns current after the last war, which already promise us a new crop of slums. Housing in so small an island as this is too serious a matter to be entrusted lightly either to private enterprise or entirely to local authorities, and in this emergency it is a disappointment, rather than a pleasure, to learn that the Government "have no intention whatever of attempting to foist on the industry, on the local authorities, or on the public, any sort of ready made, cut and dried Government-designed ideal homes." Good designs and intelligent control are precisely what is needed.

Is it certain, however, that we must wait for a programme in permanent housing to be completed before we can provide homes for all? Has the last word really been said on the possibilities of prefabrication? The public, long distrustful of the assertions of builders, will not readily believe so. The Government has made a study of methods of prefabrication, but has it gone deep enough? The minds that worried out the technical difficulties of "Mulberry" and launched that mass of concrete across the Channel were not deflected by the apparent impossibility of the task. "There must be a better way of doing this: let's try something," has been suggested as a motto for doctors. In this matter of housing it had better become the motto of the Government and the builders too.

Lord HORDER will preside over the meeting on Our Homes which the Marriage Guidance Council is holding at BMA House, Tavistock Square, London, WC1, on Tuesday, April 24, at 6 PM. The speakers will include Mrs. R. A. Butler and Dr. Charles Hill. Tickets from the secretary of the council, 78, Duke Street, London, W1.

Annotations

PENICILLIN IN SEROUS CAVITIES

WITH all new remedies there comes a stage when initial impressions must be carefully scrutinised and often revised. Such a stage has now been reached with penicillin therapy. The brilliant pioneering work of Florey and his colleagues was done with tiny supplies produced with their laboratory-scale apparatus, and made it possible to apply penicillin to clinical practice safely and effectively without loss of time. But now attention can be applied at leisure to each smaller aspect in turn; and the larger quantities available have permitted wider and more detailed studies than would have been practicable in the early days. At first penicillin was said to be bacteriostatic: now it is reported to kill bacteria during their phase of multiplication. At first intravenous or intramuscular injections were recommended because subcutaneous ones were said to be more painful and to give slower and more irregular absorption: Cooke and Goldring,[1] on the other hand, have found subcutaneous injections no more uncomfortable than intramuscular, and absorption as rapid and regular. At first penicillin was assumed to be inactive or unreliable when given by mouth: now oral dosage is reported to be a practical method of administration, and some Philadelphia and Cleveland workers report 100% cure of gonorrhœal patients with a 1–3 day course of penicillin given by mouth with trisodium citrate to neutralise gastric acidity.[2] The latest revision of accepted conceptions concerns the passage of penicillin into the fluid of serous cavities.

Early work showed that penicillin passed only slowly from the blood into the cerebrospinal fluid, and it seems to have been assumed that the same was true for the serous cavities, especially as penicillin injected into these cavities was only gradually absorbed. Recently the subject has been reinvestigated by Cooke and Goldring as part of a wider study of the distribution of penicillin in the body. In five young children with the nephrotic type of chronic nephritis and generalised œdema, observations were made on the blood, ascitic fluid, and subcutaneous œdema fluid after repeated intramuscular injections of large doses of penicillin. In general, the concentrations of the compound in these three body-fluids were closely similar one to another. When the patients were receiving injections of 1000 units per kg. body-weight every 3 hours, the concentration in all three fluids was maximal (up to 1·8 units per c.cm.) at half an hour, and thereafter diminished rapidly; at 1 hour it was only half the peak level, and after 3 hours it was usually low and almost negligible. In the cerebrospinal fluid, however, the concentration of penicillin 15–30 minutes after a large intramuscular injection was much lower than in the blood, and tended to fall to zero in 1½ hours; moreover, during intrathecal therapy, intramuscular injections did not increase the penicillin level in the spinal fluid.

This report of penicillin passing readily into ascitic and œdema fluids is based on only a few patients, and its general acceptance should await confirmation on a greater number of cases. War experience has shown that local application is an effective and economical method of employing penicillin, and this principle can be applied to effusions in serous cavities by direct injection of penicillin into the cavity; its antibacterial action there will be supported by the slowness of its absorption from these sites. Rammelkamp and Keefer[3] found that after direct injection into pleural and joint cavities some penicillin persisted for 13–22

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1. Cooke, J. [illegible] 945, 127, 89
2. J. Amer. [illegible] In a bulletin of the U.S. [illegible]
3. Rammelka[illegible] 42[illegible] Invest. 1943, 22,

hours. Until further experience has been gained, the best way of treating a penicillin-sensitive infection of a serous cavity seems to be to remove as much fluid as possible by aspiration, and to inject penicillin therein, possibly at 6-hour intervals; this treatment should be supported by the injection of penicillin subcutaneously or intramuscularly every two to three hours to prevent wider dissemination of the infection.

FIBROSITIS

THE pathology of fibrositis, like that of sciatic neuritis, has always been obscure, and recently there has been a tendency to label them both fictitious. The fibrositic nodule seemed invariably to disappear on biopsy, and states such as local muscle spasm due to neurotic tension began to be postulated.[1] Kellgren[2] made an advance by showing that irritable muscular and ligamentous foci in the back caused referred pain, which could be abolished by local injections of procaine. This view gained wide popularity until such lesions were often regarded as the primary cause of sciatica. But a new perspective was given by Elliott's demonstration[3] by electromyography that the myalgic spots in sciatica were areas of hyperactivity associated with a central excitatory state in the corresponding segment of the cord, both due to the irritation of a nerve-root by a prolapsed intervertebral disc. It remained true that the spots were troublesome in themselves, and relieved by procaine. Elliott thus provided a basis for the traditional observation of the influence of temperature and climatic changes on these aches and pains mentioned by Professor Witts in his recent broadcast[4] and supported by Dr. Hubble in our correspondence columns; for "chills" and draughts might reasonably be expected to set off such sensitive foci.

Now Copeman and Ackerman[5] have, in a rather parallel way, demonstrated a pathological basis for the old "panniculitis"—the fibro-fatty nodule formerly treated assiduously by kneading and acupuncture. The backache in febrile illnesses resembles fibrositis, and occult points of tenderness often persist which, though unnoticed by the patient, are capable of reactivation as trigger-points for later trouble. Constructing a pain chart from fibrositic cases, Copeman and Ackerman found a constant pattern of possible sites. In most cases these were the same local points over the supraspinatus tendon, medial border of scapula, at and below the iliac crest, and at three places on the lateral border of the sacrospinalis in the lumbar region. In others there was more diffuse tenderness over the sacrospinalis in the dorsal region. Examination of the back at routine autopsies showed a basic fat pattern corresponding exactly to this distribution of pain, a disposal of the deep fat related to the muscle fasciæ which was constant even in extreme general emaciation. Such fat is found, for instance, along the lateral border of the sacrospinalis, both superficially and in the angle where the fascia splits to enclose the muscle.

The hypothesis is that recumbency and illness lead to œdema of the basic fat under an unyielding investment, setting up at any point in the pattern a vicious circle of increased tension and œdema which causes the diffuse backache of febrile illness. With persistent tension, a local fatty hernia forms, either as a blob, which may be pedunculated, or as a "foraminal" type of prolapse at the point of exit of nerves and vessels, analogous to fatty epigastric herniæ. The latter type, accompanying the posterior primary rami of the first three lumbar nerves, is the basis for the three constant tender points at the edge of the sacrospinalis in this region. These lesions are thought to be the nodules of chronic fibrositis, which undergo fibrous degeneration if their pedicle twist or strangulate. The diffuse tenderness over th dorsal paravertebral muscles is thought to be due to th deep fat acting here as a sheath for the numerous loca tendons of insertion. Œdema constricts these tendons and increasing local stiffness precedes the acute attac in which they can be felt as tender elongated structures with crepitus on movement.

Particularly impressive is the discovery of these fatt herniæ, not only at autopsy but in the biopsy of man clinical cases of fibrositis cured by their removal. Cope man and Ackerman advise that the nodules should b transfixed by a stout needle under local anæsthesia, an undercut by sweeping movements of the needle-point If these carefully recorded findings are verified we ma have to think again about the whole subject. To giv one instance, in several cases severe sciatica in its fu distribution was relieved by removal of fatty hernia This, just as we have begun to accept the prolapsed dis as the cause of ordinary sciatica, is disconcerting. Bu it does show that an observer who looks closely at the sit of a symptom may still produce something out of the ha

LLOYD GEORGE AND THE MEDICAL PROFESSIO

Lloyd George was the first British statesman to com in contact with the organised medical profession on question of major importance. The report of the Poo Law Commission in 1909 showed the need for publi provision of medical services on a large scale. Mr. Lloy George liked to do things in a big way, and to lose no tim in getting them done. In his Budget speech on April 29 1909, he announced the Government's intention to brin in a scheme of National Health Insurance based on th German model, and though the importance of his state ment was not for some weeks noted in the medical press it was appreciated in the British Medical Association When, on May 4, 1911, the National Insurance Bill wa introduced into the House of Commons, the Associatio had formulated in its famous Six Cardinal Points th conditions that would have to be fulfilled before th doctors would undertake to participate in the insuranc system.

Unfortunately, the Bill had been prepared virtuall without consultation with the leaders of the medica profession, and it seemed to perpetuate and extend th conditions of "club practice," which had already bee shown to be highly unsatisfactory. Moreover, it appeare that the insurance doctors were to be underpaid. Mr Lloyd George, introducing the Bill, said that thoug some friendly societies paid only 2*s*. 6*d*. annually pe member for medical care, the average sum was 4*s*.; and according to the official parliamentary report he added: "I think financial provision ought to be made in this scheme for raising the level to 4*s*." In the *British Medical Journal* of May 13, 1911, it was stated that "to 4*s*." was a misprint for "of 4*s*"; but the error had been before the public for over a week, and was one of the lamentable events that created a wide rift between Mr. Lloyd George and the medical profession. He attempted to establish better relations, and on June 1, 1909, he addressed a special representative meeting of the BMA at which he undertook to modify the Bill by embodying nearly all the cardinal points. Useful amendments were accordingly made. The administration of medical benefit was transferred from the approved societies to specially constituted insurance committees, including medical representatives; all qualified practitioners were given the right to attend insured persons under the scheme; and the insured were permitted to choose, and change, their doctors. The question of remuneration was reserved for later consideration. In October, 1912, when the amount of medical remuneration offered was stated for the first time, further concessions were made, but without removing the BMA's hostility to service under the insurance scheme. Moreover, the annual

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1. Ellman, P., Savage, O. A., Wittkower, E., Rodger, T. F. *Ann. rheum Dis.* 1942, 3, 1.
2. Kellgren, J. H. *Lancet*, 1941, i, 561.
3. Elliott, F. A. *Ibid*, 1944, i, 17.
4. [illegible] *d*, March 24, 1945, p. 382.

[illegible], W. S. C., Ackerman, W. L. *Quart. J. Med.* 1944, 13, 37.

capitation fee offered per insured person on a doctor's list, 7*s.*, was below the 8*s.* 6*d.* demanded by the Association. Yet when on Jan. 15, 1913, medical benefit came into operation, 17,796 practitioners had accepted service under the insurance system.

Looking back, there can be no doubt that Lloyd George meant to deal fairly and even generously with the medical profession. He knew that their coöperation and goodwill were essential to the successful working of the gigantic system of health services he had created. There is nothing in his long career to suggest that when great national questions were at issue he was moved to the exercise of unduly stringent economies: indeed, as the *Manchester Guardian* points out, when he became Chancellor of the Exchequer he rejected the traditional view of that office, preaching and practising the economy of wise expenditure. In handling the provision of medical services he was on unfamiliar ground, and made mistakes *that could have been avoided* by the preliminary connaissances which nowadays precede legislation. On the other hand he had that capacity to come, see, and conquer by which a few men work great changes the large majority, for all their good intentions, der it their main duty to describe the obstacles to action. By his vigour he gave this country the first instalment of social insurance, and thereby strengthened it against the strains of war and economic depression. If he had done nothing else—and he did much—he would deserve the thanks of all his fellow countrymen, including his opponents of 1911.

THE HYPERABDUCTED ARM

NEUROVASCULAR disturbances in the upper limbs have been attributed to a variety of anatomical abnormalities in the neck. Thus Elliott and Kremer[1] lately demonstrated that some cases are due to herniation of the 6th cervical intervertebral disc. Obliteration of the subclavian artery, and abnormal stretching of the brachial plexus or its branches, which also lead to these disturbances, may however be produced in some normal people if they adopt the appropriate posture. Thus Falconer and Weddell[2] investigated 50 normal men and 50 normal women, aged 19–47 years, and found that in 25 of the men and 20 of the women the radial pulse was affected by backward and downward bracing of the shoulders, the pulse being obliterated in 18 cases of each group. An even more striking illustration of such obliteration is reported from America, where Wright[3] has investigated the effect of hyperabduction of the arms on the radial pulse in 150 normal young adults. Hyperabduction he defines as "that phase of circumduction which brings the arms together above the head (with the elbows flexed or with their long axes corresponding in plane to that of the body)." He found that the right arm pulse could be interrupted by this procedure in 125 cases (83%), and the left arm pulse in 124 cases. In only 11 cases could no obliteration be produced in either arm. The facility with which the pulse could be stopped varied considerably, but it was easily done in 94 cases on the right and in 95 cases on the left. The two likeliest sites for this stretching or torsion of the blood-vessels are where the subclavian vessels and the trunks of the brachial plexus pass behind the pectoralis minor muscle and beneath the coracoid process, and where they run between the clavicle and the first rib.

The clinical significance of these observations deserves investigation. Some people sleep with their arms hyperabducted, and Wright records 4 cases in which the adoption of this attitude in bed seems to have led to neurological and vascular changes in the upper limbs. Some of his normal subjects said they often fell asleep in this position but were usually awakened by discomfort or pins and needles in the arms and had to move them. It is also a position adopted in certain occupations, such as painting ceilings, and, as Wright points out, the arm may be deliberately hyperabducted on the operating-table or in splints or casts. Before fixing an arm in this position it would be wise to make sure that the circulation is not interfered with.

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[1] Elliott, F. A., Kremer, M. *Lancet*, Jan. 6, 1945, p. 4.
[2] Falconer, M. A., Weddell, G. *Ibid*, 1943, ii, 539.
[3] Wright, I. S. *Amer. Heart J.* 1945, 29, 1.

A METHOD OF TREATMENT PATENTED

IT is unusual for medical men to take out a patent for a method of treatment or prophylaxis. This course has been adopted by the originators[1] of the method of treating and preventing silicosis by inhalations of aluminium powder. The reasons for patenting the method are given by Dr. Robson in a paper read to the Canadian Institute of Mining and Metallurgy.[2] He says that the use of aluminium in silicosis therapy has been patented in most of the principal countries of the world, because:

(1) We were concerned in the earlier stages, lest some outside party, learning of our work, might apply and obtain a patent, then attempt to fit the process into a commercial venture.

(2) We realised also that, whatever might be the advantages obtained from the use of aluminium powder, it could not be used as a substitute for dust control. Moreover, even with good housekeeping, it was necessary that the aluminium powder should be administered under

(3) haphazard methods , many things could have happened that would cast unfounded suspicion upon the process and thus delay its wider application and the benefit it is expected to bring to those suffering from silicosis or exposed to the hazard of siliceous dust.

(4) The discoverers were determined that all benefits to be derived from the use of the process should be made available to those suffering from or threatened by silicosis, so far as is practicable, *without let or hindrance* (our italics).

Denny and Robson transferred the patents to McIntyre Research Ltd., a company formed by them together with the McIntyre Porcupine Mines Ltd. Jacob[3] states that the commercial manufacture of aluminium powder for prophylaxis has been undertaken at the McIntyre Mines since October, 1943. Robson goes on to say that McIntyre Research Ltd. offered the use of the process to the world without compensation or hope of reward, stipulating only that a licence fee should be charged sufficient to cover the cost of administration and to provide in due course enough revenue for the support of further research on silicosis and similar diseases.

The practical effect of the patent is that any investigator or body in England, wanting to test the action of aluminium in the prevention or treatment of silicosis, will have to apply for permission from McIntyre Research Ltd. in Canada. A licence fee (amount not stipulated) will have to be paid, and the aluminium powder used will have to be approved by the research company. Presumably if anyone is rash enough to give silicotic patients inhalations of aluminium powder not approved in Canada, he will render himself liable to a court action for infringement of patent rights. May not the effect of the patent be opposite to what the discoverers of the method wish—namely, that it should be "made available to those suffering from or threatened by silicosis . . . without let or hindrance"? It seems possible too that the method will be discredited more by the act of taking out a patent than by allowing investigators in other industries and in other parts of the world to experiment in their own way and not only with aluminium powders approved by McIntyre Research Ltd. The published results of treatment and prevention of silicosis by the aluminium method, while suggestive, are not yet convincing, and much more work by independent and untrammelled observers is needed to establish its efficacy.[4]

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[1] Denny, J. J., Robson, W. D., Irwin, D. A. *Canad. med. Ass. J.* 1937, 37, 1; 1939, 40, 213.
[2] Robson, W. D. *Trans. Canad. Min. Inst. (Inst. Min. Metall.)* 1944, 47, 172.
[3] Jacob, A. W. *Ibid*, p. 185

ANOTHER ARSENICAL FOR SLEEPING SICKNESS

LAST year Harry Eagle and his associates[5] at Johns Hopkins worked out the trypanocidal action of a large number of substituents of phenyl arsenoxide, $\mathrm{O{:}As{\cdot}C_6H_5}$, in laboratory animals and in vitro. Among the interesting generalisations which emerged, many confirming the work of others, was that the introduction of acidic groups into the benzene ring causes a striking drop in trypanocidal power. An outstanding exception to this rule was γ-(*p*-arsenosophenyl)-butyric acid, $\mathrm{O{:}As{\cdot}C_6H_4{\cdot}}p\mathrm{(CH_2)_3COOH}$, which possessed a particularly favourable therapeutic index in mice and rabbits, and was effective against trypanosomes resistant to most other arsenicals. So impressed was Eagle by the laboratory performance of γ-(*p*-arsenosophenyl)-butyric acid (we would gladly call it by a short name if it had one) that large field trials of the compound were begun last summer, with the collaboration of the Sleeping Sickness Services of the Gold Coast, Nigeria, Belgian Congo, and the British West African Forces; and Eagle has now published[6] a preliminary report on the first few hundred cases treated, none of which had yet been followed for more than eight months. He concludes provisionally that in *early* cases, without involvement of the central nervous system, cure may be expected from a course of daily injections of 0·4 mg. per kg. covering less than a fortnight. In late cases, however, where there is evidence of involvement of the central nervous system, most patients did not respond, and two died with symptoms suggestive of a toxic encephalopathy.

Good immediate results in an average sampling of early *T. gambiense* cases would no doubt also have been obtained with several other arsenoxides, such as mapharside (neo-halarsine), $\mathrm{O{:}As{\cdot}C_6H_3(}m\mathrm{\text{-}NH_2)(}p\mathrm{\text{-}OH)_2}$, or an amide substituent, notably $\mathrm{O{:}As{\cdot}C_6H_3{\cdot}(}m\mathrm{\text{-}NH_2)(}p\mathrm{\text{-}CONH_2)}$. But the important advantage claimed for the compound selected for field trial—its effectiveness against so-called arsenic-resistant trypanosomes—is not likely to be shared by the other compounds which gave good results in laboratory animals. It is of course no novel idea that trypanosomes which have become resistant to one group of arsenical compounds may yet remain sensitive to another. Ehrlich[7] showed many years ago that a number of arsenobenzene derivatives, of which arsenophenylglycine is a type, were capable of curing "arsenic-resistant" infections. These derivatives were all characterised by the presence in their make-up of the acetic acid radicle, $\mathrm{\text{-}CH_2{\cdot}COOH}$. In Ehrlich's picturesque imagery the trypanosome was believed to possess an arsenoceptor and an aceticoceptor. According to this idea the more usual forms of trypanocidal arsenical are lethal to the trypanosome because they fasten themselves to its arsenoceptor. When a trypanosome is made resistant to these arsenicals the arsenoceptor is believed to atrophy, or to lose its avidity for the arsenicals to which it is by nature adapted, with the result that these drugs can then no longer find a lodgment on the trypanosome. Such a compound as arsenophenylglycine, however, is still able to destroy "arsenic-resistant" trypanosomes, since by virtue of its acetic acid radicle it can still attach itself to the trypanosomes by engaging with their aceticoceptors. Modern theorists, following Fildes,[8] will perhaps prefer to think along the lines that the arsenophenylglycine type of compound has the power of interfering with an essential metabolite (conceivably by competing for its associated enzyme) which the other arsenicals have no power of influencing. Another, perhaps more plausible, way of looking at the matter is suggested by King and Strangeways.[9] According to their view the critical factor in the behaviour of compounds of the arsenophenylglycine type is the presence of the -COOH group, which need not necessarily be in the form of $\mathrm{\text{-}CH_2.COOH}$. Arsenoxides which contain this carboxyl group form water-soluble sodium salts, and would for the most part be present as ions. They therefore differ from other arsenoxides in the manner by which they gain admission to the body of the trypanosome, the particular process being such as to allow entry as readily into "arsenic-resistant" as into normal trypanosomes. Eventual destruction of the trypanosome might, on this view, be brought about by interference with the same essential cell constituent in resistant as in normal individuals.

Whatever the actual mechanism involved, it seems that Eagle's new compound is to be included within Ehrlich's category of arsenicals akin to arsenophenylglycine, in exhibiting the associated features of a terminal $\mathrm{\text{-}CH_2{\cdot}COOH}$ group and a power over trypanosomes which have become "arsenic-fast." But effectiveness against such trypanosomes does not necessarily imply effectiveness against naturally resistant strains, so the results of trials against human *T. rhodesiense* infections, which are notoriously refractory to arsenicals, will be especially interesting. Judging by Eagle's paper, one might expect these results to be satisfactory, because mice infected with a strain of *T. rhodesiense* were cured by his compound in the same dosage as had proved curative with the standard strain of *T. equiperdum*. However, we understand that the tests with *T. rhodesiense* were done with the Liverpool strain, and that in the course of a considerable number of passages through mice this strain has lost its pristine resistance, and is now extremely sensitive to arsenicals. The fact that the new drug easily cures mice infected with this particular strain is not then a sound basis for expecting it to be effective against *T. rhodesiense* in man. Ehrlich's arsenophenylglycine, tried extensively in man before the last war, gave very good results in early cases of sleeping sickness in West Africa, where *T. gambiense* is the parasite, but in Tanganyika, where *T. rhodesiense* predominates, the results were poor. It will not be surprising if the new drug behaves in the same way.

The diamidines will cure early cases of sleeping sickness in a fortnight or less, and they certainly act on the naturally arsenic-resistant *T. rhodesiense* in man. The new drug may prove less toxic than the diamidines, but pentamidine, at any rate, has given little trouble in this respect, when used in reasonable dosage. What we really need is a single drug which is both lethal to "arsenic-fast" trypanosomes and effective in late cases. Ideally, only one injection should be needed for a cure.

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[4] See *Lancet*, 1944, ii, 50.

[5] Eagle, H., Hogan, R. B., Doak, G. O., Steinman, H. G. *Publ. Hlth Rep., Wash.* 1944, 59, 765.

[6] Eagle, H. *Science*. 1945, 101, 69.

Ehrlich, P. *Z. angew. Chem.* 1910, 23, 2.

des, P. *Lancet*, 1940. i, 955.

[9] King, H., Strangeways, W. I. *Ann. trop. Med. Parasit.* 1942, 36, 47.

We have to record the death on March 28 of Colonel A. W. SHEEN, consulting surgeon to Cardiff Royal Infirmary, and provost of the Welsh National School of Medicine. He was 75 years of age.

MEDICAL RESEARCH FOR THE COLONIES.—The appointment of a medical research committee to advise the Colonial Office on research for the benefit of colonial territories is a sign of our growing sense of responsibility towards the citizens of these parts of the Empire. The committee has been created jointly by the Secretary of State for the Colonies and the Medical Research Council, and is composed as follows: Sir Edward Mellanby, FRS (chairman); Colonel J. S. K. Boyd, RAMC; Prof. P. A. Buxton, FRS, Dr. A. N. Drury, FRS, Brigadier N. Hamilton Fairley, FRS; Dr. W. H. Kauntze; Prof. B. G. Maegraith, Dr. B. S. Platt; Major-General Sir John Taylor. Dr. F. Hawking is the secretary of the committee.

Special Articles

PSYCHOPATHIC REACTIONS IN LIBERATED COUNTRIES

A. M. MEERLOO, MD LEIDEN
LIEUT.-COLONEL, ROYAL NETHERLANDS ARMY

NOBODY doubts that social circumstances influence human character, or that certain tragic periods in the history of men leave deep scars in the human psyche. Those who live at such a period are not usually conscious of temporary or permanent alterations in their own mental condition. But when it is all over and they are able to look back on their past with a measure of tranquillity they begin to realise how unusual was their behaviour at the time.

Have people changed on the whole during or because of the occupation of their countries? Has their emotional life been influenced and do they react differ-
This is the important question,
us better insight into the post-
in various occupied countries.
iod, I do not want to attribute
events like those in Greece entirely to a change in the behaviour of men. During war and occupation the social struggle still goes on. Much however must be imputed to the unbalanced reaction of an oppressed and half-starved population. Such people must have rest and food before they can be expected to act normally once more. A clear insight into this must necessarily
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EFFECT ON THE YOUNG

Let us see just what in my country has most affected human behaviour. There is, in the first place, the unremitting corrosion of fear, which undermines the nerve and reduces reactions to a primitive level. Starvation and exhaustion too have played a big part. Owing to the long duration of the occupation people have not quite realised this, since after a few weeks of hunger the stomach ceases to clamour for food, though physical resistance continues to diminish. In the end people become apathetic, restless, and lacking in their initiative. Thirdly we have to take into account the involuntary mental infection of German propaganda. There is a period when one opposes fascism and cruelty, but after
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norms have had little opportunity
influencing the child. Conceptions of mine and thine mean little to them: to them it seems that the adult
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this partial demoralisation will lead to extremely
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to recover their normal behaviour.
experience to draw upon here. People who escaped from occupied territory acclimatized themselves with difficulty to normal life. In some cases the process took more than six months.

CHARACTERISTIC FINDINGS

What are the characteristics of this psychopathic attitude? There are three groups of symptoms.

In the first place there may be *general mental paralysis*, a complete passivity and apathy. People just sit about and wait for something to happen. They are tired, depressed, and shy, and they expect all initiative to come from others. Therefore it is difficult to make contact with them: our arguments do not reach them; they need fiercer stimuli in order to overcome that mental paralysis, and this finds its expression in an absence of sensitiveness and in irritability. It is very difficult not to quarrel with them. Their moods are fluctuating, easily influenced by good or bad tidings, and they have no control over their own emotions. They are and remain restless and unreliable, and they find great difficulty in concentrating on any problem. Of course, they are easily tired and exhausted by very little work. Blood-pressure is low and the consequences of the food scarcity are not quickly overcome, even on a normal diet.

Next, they show *intense suspiciousness*. It is difficult to adapt oneself to freedom, and for that freedom to penetrate into one's instinctive reactions is a slow process. Fear is not readily eradicated, and the enemy still lingers on in one's consciousness. The frightened glances, the attitude of suspicion towards even old friends, are typical; nor is the habit of looking for
Kindness alone will not pierce
spirit of criticism which has
y armour. An underground
still suspicious of officials, is
still averse to giving particulars of himself; he has in fact not yet been liberated. In some cases I have seen this suspicion grow into real persecution mania, for which the only cure is a long period of rest.

A third symptom
authoritarian attitude,
acceptance of the G
This is a law of life: what one fights against one absorbs: one can never completely escape the fascination of the enemy. All forms of underground work and sabotage have strengthened this attitude; each one asks for a strong leader and in
himself to possess t
tendency to egoism
there was unity of hatred, expressed in common action against the enemy, but after the liberation that still unsatisfied hatred remains, and is partially converted into jealousy and aggression against everyone else. The one-time unity of resistance disintegrates into mutually competing forces.

CASE-HISTORIES

The following cases illustrate the *extreme* forms of psychopathy in occupied countries, and of the mentality I have just described.

CASE 1.—A post-office clerk having lived for 3½ years under the occupation, escaped to Belgium and lived there with false papers. He had taken part in writing for the underground press and was obliged to escape. After the liberation of Belgium he made contact with his compatriots, but refused to give his name. He was slow in his movements and has a strange, stiff appearance. Up to the moment of liberation he had been normal; then he became more and more passive. He crouched in a coma for days on end staring at nothing in particular, almost like a case of catalepsy. He had to be urged on to do anything; only after a few weeks could he be put to his normal job, but even so he remains quiet and passive. There was no history of mental disease in his family.

CASE 2.—A medical practitioner had done very useful resistance work among his colleagues. After the liberation there was a change: he carried on his practice mechanically, he did not talk or discuss things any more and at night stayed at home sitting in
Yet he continued to fulf
When I visited him two
as the only possible expl the fact that all this has proved to be too heavy a strain for him. Now, 5 months afterwards, he is still not his old self again, though he has improved much, thanks to opium and extra food rations.

CASE 3.—A student helped to publish an anti-German book during the occupation. He was arrested for his activities but managed to escape. After many adventurous wanderings through Belgium and France he reached the Pyrenees. Here during the long journey through the snow the first paranoid symptoms appeared. On arrival in England they became so bad as to necessitate a short term of treatment in a *mental home. He regarded everybody as a German spy* or a Gestapo agent. After six months' rest in normal surroundings he managed to control his pathological suspiciousness. No history of mental disturbances in his family.

CASE 4.—A girl student, who during the war actively and conscientiously had taken part in the underground movement and who on account of this obtained a position of confidence after the liberation, was accused of theft. During the last weeks she had become very rebellious, inclined to acrid criticism, and to abnormal meddlesomeness. She had occasional fits of crying. A primitive kleptomaniac syndrome had developed, a kind of nest instinct making her unable to escape the urge to collect possessions. She had become very extreme in her political opinions, and maintained that Hitler had been right after all. After a rest period of several weeks she became quiet again and began to learn how to adapt herself, but she was still inclined to criticise and protest. Her own explanation was, that she could now let out everything which had been suppressed during the occupation. She had to give utterance to it, she could not hold it back anymore.

RECOVERY

This triad of symptoms—apathy, suspicion, and increased aggressiveness—characterises the psychopathic attitude resulting from the occupation. We shall come upon it in many people who have lived under these conditions. Gradually when people get better food and more rest, and can adapt themselves to a more normal society, the normal reactions will come back. They will become more equable then, will not talk so much about themselves, the anxiety symptoms will disappear, their minds will become active once more and they will become absorbed in the more important problems of our time. But all the same, occasionally—as a result, perhaps, of some unpleasant experience—the old suspicion may awake again and restlessness may return. Among the young the after-effects will be felt longer than among the older people, whose characters were already formed before the war.

All this goes to show how heavily Europe is going to suffer psychologically after the war. Terror and fear and exhaustion will continue to make themselves felt for a long time and the problems of mental hygiene and psychological recovery of the masses will surpass in difficulty many other problems. In these unstable psychological conditions it will be difficult immediately to create that political stability that is needed for the complete recovery of the severely stricken populations of Europe.

Panel Practice

Medical Records Again

THE Somerset insurance committee have been considering the failure of three practitioners to return forms of medical record for insured persons whose names had been removed from their lists. One of them owed 218 records, 74 of which were needed by the doctors to whom the patients had transferred. He had come before the medical service subcommittee four times previously for the same reason, and the committee recommended the Minister of Health to withhold £40, for deduction from his remuneration.

At present all civilian medical practitioners are overpressed; but undoubtedly the best way to avoid difficulty over these records is to deal immediately with the insurance committee's applications, which are made at regular intervals. The time taken in extracting say 20 medical records from a properly kept alphabetical list cannot be more than a minute or two, and when the records are extracted all that remains to do is to put them in the appropriate envelope, usually provided by the committee, and post them. It is delay which causes the work of extracting and despatch to become formidable.

Clause 9 (12) of the Terms of Service lays it down that a practitioner is required to keep and furnish records of the diseases of his patients and his treatment of them; but many doctors, *if they read this clause at all, seem to* stop short at the word "keep"—which they sometimes interpret as "retain."

Forms of medical record have a twofold purpose. F[illegible], they provide a clinical history, which will be needed by the doctor to whom an insured person transfers. *Secondly they form the list of persons in the* practitioner's charge. The insurance committee has to prepare and keep revised the list for each practitioner and furnish him with a copy of this list, and of alterations thereto. The practitioner who does not return the medical records of patients for whose treatment he has ceased to be responsible runs the risk of having to provide treatment for people who are no longer insured, for whom he will have no remuneration. Also he is imposing on the chemists' account an improper charge in respect of any medicines or appliances ordered on NHI prescriptions for such persons.

In the Somerset cases the chairman said there was no evidence of any neglect of patients by the doctors. But this was only part of the picture. The doctors to whom many of these patients had transferred were deprived of the clinical records they ought to have had.

In England Now

A Running Commentary by Peripatetic Correspondents

AFTER three weeks in Washington, the unbiased observer—*and no observer worthy of the name would* admit to bias—finds the number of things better done over there pretty well balanced by the number of things we do better in London. On the one side, one might begin with architecture, coffee, and telephones; on the other, with litter, heat, and maps.

Washington architecture, high and low, is more streamlined, simpler, less decorated for the mere sake of decoration; and, in private houses, paint for the wood and metal work is more attractively used. Of course, the absence of smoke and dirt helps greatly, as does the almost universal "porch" or verandah. To offset the clean atmosphere is what—at least to the Englishman now conditioned by a campaign for paper salvage—can only be called the appalling amount of "trash" (anglicé, rubbish) with which every sidewalk, lawn, park, and thicket is disfigured. One begins to wonder whether the Fifth Freedom for which America is fighting is not the freedom to leave litter about. If London, with its assorted bombs (hard centres, soft centres, and acid drops) and its more acute labour shortages, can keep itself comparatively free from rubbish, why can't the much more beautiful and unbattered Washington?

To the Englishman in America, the reason for the admirable and universal ice-water is at once apparent. It is to make up for the perspiration loss from the heat at which buildings are kept. Before my arrival I had read that one of those curious "requests," which are really orders, and the mechanism of which is so hard to understand, had been promulgated, reducing the temperature level of Government offices, but Americans themselves say that everything has been rather hotter since the "request," so perhaps the mechanism went wrong. Anyway, the stranger has to keep on reminding himself that, if native Americans like a foretaste of hell on earth, why should he complain because the heat threshold to which he is accustomed is different, especially as this is probably due to the inefficiency of his own heating systems. As to coffee, I reckon to have drunk some 70 cups in three weeks, and only one was not superlative; could one drink 70 cups of tea in England and say the same? As with coffee, so with telephone calls. I have experienced none of the maddening delays and wrong numbers we got even before the war in England, and to have a bright "You're welcome, sir" answer one's halting thanks after being helped by the operator produces a euphoria unknown to telephone users in the UK. Maps are perhaps a small bee in my bonnet; but I was disappointed to find that a map of the country around Washington was unobtainable in any bookshop, and to hear from friends that there is nothing comparable to the inch and ½ inch to the mile Ordnance maps on sale at nearly every stationer's in England. The only maps available seem to be small-scale road maps prepared by the oil companies, which is perhaps natural, for Americans do not walk or cycle, but progress from crawling through toddling to motoring.

One striking and pleasing trait is that even the humblest workers are treated, and consequently behave, as individuals. Coloured lift-attendants are named on a plaque in their elevators. Secretaries have their names on their desks; and store advertisements tell you that Mr. X, Assistant Manager in the Shoe Department, will personally hope to see you at his sale so that he can show [illegible] 's the [illegible] yone [illegible] g this [illegible] best [illegible] ns of [illegible] igion and patriotism make this a fine place to work in."

* * *

Most of us men have acquired a new intimacy with dish-washing in the last five or six years. Memory may recall the time 30 years ago when the cleaning of dirty dixies and the personal knife, fork, and spoon was a daily duty, but in peace-time the more junior medical man's experience was often limited to bottle-washing and an occasional locum in the home kitchen when the household was temporarily maidless. Now, alas, washing-up often an integral part of masculine daily routine and have come to learn that there is a proper procedure the scullion's art. While occupied with the breakfast dishes this morning I was reminded, as a chipped cup passed through my hands, of the horrid revelations on [illegible] LANCET of [illegible] g scrutiny [illegible] y destruc- [illegible] with any [illegible] ay to the

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hy are all taps so placed over the sink that they act as *continual hazard to the safe passage of the china?* suspect a deep conspiracy between potters and sink-akers.) Perhaps, too, people washing other people's rockery are not quite so careful as they would be of heir own property. Anyway, there was a good-sized ailful of assorted oddments, and I began to wonder. here is a chronic shortage of crockery in the hospital, eplacements are slower than ever in arriving, and there a particular dearth of saucers and small plates (another onspiracy here?). These reflections, while sobering he b [illegible]

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The team were examining workers in a foundry while investigating occupational risks. We were all full of enthusiasm and energy. The factory doctor's rooms had been put at our disposal and the various parts of the examination arranged therein. Business was not very brisk during the morning but we broke off at mid-day determined to get a good score in the afternoon. After an excellent lunch in the factory canteen we returned to the clinic and waited, looking expectantly at the candidates' entrance. A gentle knock and in came a pleasant little man. We all sat up and tried to look brightly encouraging. He was claimed first by the history-taker. Very slowly and shyly he responded with the answers to many searching questions. Next followed an exercise-tolerance test and a vital-capacity estimation. He seemed a little bewildered, but we bundled him in to the physician who had his clothes off in a second, listened to his chest, counted his teeth, and investigated his ability to touch his toes. He made no complaint, though perhaps he had a faint air of one who found himself inadvertently in a lunatic asylum. Next he was ushered in to the technician who took a blood-sample. He was the only candidate we had whose vein continued to bleed after the needle was withdrawn, and it was while first-aid was being applied to stop a positive Niagara of blood that he mildly remarked that he supposed it was all right but he had really only come in to see the factory doctor about his seborrhœa. We had press-ganged the metallurgist.

Letters to the Editor

DISCIPLINE IN A MEDICAL SERVICE

SIR,—Mr. Somerville Hastings's Chadwick lecture (Jan. 20) contains much good stuff; but he speaks too often of discipline. He seems to think that because of this the administrator is in a class apart, just as did that body of medical superintendents who demanded £200 a year more than others in the hospital world because of this necessity of keeping "discipline." So complex is medicine today that the administrator comes into the work of all of us; but not alone. He and the clinician must work together so that the latter can do his part properly, just as do the anæsthetist and the surgeon.

The administrator should be given powers of inquiry in order to see why things are not working smoothly, or how, though good, they may be improved; but every time a junior—or for that matter a senior—is called to the office, it should not be to be put upon the carpet. A junior may need to have his attention drawn by the superintendent to the fact that his constant late arrival in the wards upsets the whole arrangements for the service of dinner 2½ hours later, just as he may have to be told by the senior physician that a lumbar puncture done just after the laboratory has closed, instead of an hour earlier, makes it valueless; but that does not mean that, because the one fault involves the many and the other the one, the administrator is on a different plane from the clinician.

It is just these matters of minor discipline that should be thrashed out in a medical committee. In matters of graver moment it is doubtful whether even the committee of management are suitable. Nor should discipline be limited to "the junior staff." The medical superintendent himself *needs to come under it also.* When he has self-discipline he will have no difficulty in the discipline of his staff, but when this is absent he needs discipline from above more even than the juniors. He does so much more harm. No hospital is efficiently run in which the medical superintendent finishes his breakfast at 11 AM, or (living in a flat over his office) does not come down till 10.30 or 11 AM, and is obtainable after lunch only with great difficulty. And what about those above him? Is there any means—other than sneaking—for them to know about such a superintendent? If they do know but take no action, they themselves need disciplinary control. Absolute security on the part of such officials is as harmful to the State as want of security.

At the same time [illegible] clinicians using thei [illegible] report to them on [illegible] without his knowledge.

No! What we [illegible] the code of the [illegible] will not be any u [illegible] on the way that [illegible] workers, and ac [illegible] that there will never be a Diploma in Administrative Medicine. I doubt whether all this development of diplomas between the wars has been a healthy one. I am certain that an inefficient nobody would be the first to [illegible]

siderable variations either way from that golden mean called a living wage, the conditions of service are of far greater importance than the surety. A good job poorly paid is a better one than a bad job well paid. You can never neutralise bad conditions of service by increasing rates of pay; and if there is a bad job poorly paid, the first thing to do is to amend the terms of service and then to adjust the pay to the new terms. But these conditions of service are the very things that ought to be thrashed out in a medical committee. I believe that in every stage of every job in the new health service determination of terms of service should be made separately from any discussion of rates of pay—in a different committee, with different bargaining bodies, and distinct for each separate job. Some organisation *to ensure this should be set up in the service.*

UNRRA, Rome. T. B. LAYTON.

HÆMOTHORAX

SIR,—I was very interested in the paper by Mr. Price Thomas and Dr. Cleland in your issue of March 17, dealing with the late stages and treatment of hæmothorax. The final results in cases of gunshot injuries of the chest concerned me very much in the last war, and in a paper read before the clinical congress of the American College of Surgeons in 1918 I dealt with this matter (*Surg. Gynec. Obstet.* January, 1919, p. 17). At that time I was much impressed with the value of thoracotomy where impairment of function of the thorax had followed such a wound. In a limited number of such cases I operated removing the organised clot, releasing the lung, dividing strong adhesions, and clearing the costophrenic angle, and thereafter carrying out suitable exercises, aimed at re-expanding the chest. The results were encouraging. At that time I had not used suction drainage, which may have a profound influence in bettering the after-results. These questions will become of increasing importance as a residue of patients suffering from the late results of chest wounds comes under observation, and as a matter of interest I would like to recapitulate what I then considered the indications for operation in these late cases :

1. Foreign bodies in the parietes, with or without sinuses.
2. Foreign bodies in the lung, irrespective of size, if associated with persistent cough, hæmoptysis, or suppuration.
3. Large foreign bodies in the lung, even if the symptoms are mainly nervous.
4. All foreign bodies lodged in the pleura, with or without empyema.
5. All cases of infected hæmothorax.
6. All cases of through-and-through wounds with shrinking of the side, lessened lung expansion, and interference with movements of the diaphragm, in which treatment by exercises has failed.

Alas I have not had an opportunity of dealing with these conditions following the present conflict; but so far as my experience goes of those cases which have now and again come under my care during the years succeeding the 1914–18 war, I am prepared to state that the conclusion at which I arrived at the time when I wrote my paper probably still hold good in principle.

London, W12. G. GREY TURNER.

THE FIBROSITIS OF WITTS

SIR,—Those *Lancet* subscribers who put reading before listening will be grateful to your Peripatetic Correspondent for his succinct summary of Professor Witts's admirable broadcast on March 11. That the Nuffield Professor of Medicine should publicly declare his pain in the left shoulder to have been due to fibrositis shows unusual courage, for it is well known that to admit, in Oxford, to a pain between occiput and coccyx *not* due to herniation of the nucleus pulposus is to expose oneself to a psychiatric downgrading. That he should still believe in fibrositis may reveal a donnish devotion to lost causes, but his insistence that his muscle pain was caused by lying in a draught shows sound Lancastrian common sense, no doubt carried by his genes together with the rheumatic constitution. Your correspondent opines that the listening bookies were ready to put 100 to 1 on the draught and I am proud to share their confidence in the filly *Fibrositis*, by *Chill* out of *Constitution*.

It must be remembered that not all would agree with Witts, the mythical bookmakers, and myself. For example, the great Trotter wrote, "Colds and phenomena of the order of draughts and wet feet—alleged causes of colds—are sufficiently common to afford ample opportunities for the discovery of insignificant sequences. This fact, together with the psychological influences tending to associate healthy with comfortable conditions, has produced a veritable folk-lore of colds and chills which true scientific observation would speedily explode, and which presents clinical medicine in one of its least edifying aspects"—a judgment that I find as chilly as the Professor's draught. Your correspondent reports Witts as discussing muscle-pain as a conversion symptom and concluding that he found it difficult to conceive that emotional disorders could cause structural change. If it be allowed that the mind can cause autonomic imbalance then it has to be admitted that in this way structural change can and does occur, of which simplest and commonest example is asthma.

There is one variety of muscle-pain which appears to have an identical pathogenesis with that caused by draughts. This is associated with excessive sweating and is common today in miners and [illegible] that their work is too heavy for them. [illegible] due to anxiety and their muscle-pain is apparently related to heat-loss caused by evaporation of sweat. If we allow that structural change is caused by the open window, can we deny that it may also be caused by the fixed idea ? The discovery of a latent virus which was activated in appropriate physical conditions by multiple factors, as is the virus of herpes zoster, would resolve any difficulties in these rheumatic states.

James Collier wrote categorically in his article on Bell's palsy in Price's *Medicine* that it frequently followed undeniable exposure to draught. His successor, Dr. Walshe, with a higher index of scepticism, excised such scandalous information. It is apparent that what one believes in such matters is almost as uncontrollable as is the shape of one's nose.

Derbyshire Royal Infirmary. DOUGLAS HUBBLE.

STRESS FRACTURES OF THE FIRST RIB

SIR,—Alderson's reply to my criticism has served two very useful purposes. In the first place it convinces me that I should never have permitted the inclusion of the alternative descriptive word "stress" in my original survey of a particular type of lesion. I believed then that the term "stress" fracture was useless and liable to be misleading; but it was a term suggested by the Faculty of Radiology, and I therefore included it, so that the name might be discussed and finally determined. But Alderson's insistence that the fractures of the first rib which he is finding are "stress" fractures demonstrates that this term must be finally abandoned, for obviously all fractures can be included under such a heading. The point I wish to make is that the fractures I have described under the title of "fatigue" fracture bear no resemblance to the fractures which undoubtedly have occurred unnoticed, and which Alderson's work has brought to light.

"Fatigue" fractures are not related to muscle pull, nor are they resultant from muscular action: they are essentially *incomplete*; the fracture line is fine and involves only part of the cortex. It is often difficult to see, and almost invariably callus and pain are the features which draw attention to the lesion. There is never displacement. The lesions, in my experience, invariably are characterised by complete healing, one of the striking features being the manner in which the bone structure recuperates; so that in all but the most severe examples the lesion is unrecognisable within months.

In fractures of the bony portion of the first rib, on the contrary, the bone is completely severed. The bone is always split open, either transversely or obliquely. There is frequently quite considerable displacement of the fragments. Non-union, or the formation of a false joint, does occur. There is abundant evidence that muscle pull does precipitate the fracture, for quite a number of cases are recorded in which no other cause could afford a reasonable explanation (e.g., Aitken, A. P., Lincoln, R. E. *New Engl. J. Med.* 1939, 220, 1063).

Omitting all cases where there is any suspicion of violence . . . I agree with Alderson that the lifting of heavy weights is one of the occupations most likely to produce fracture of the first rib; but I disagree with his explanation, because it ignores the fact that the first rib has adequate means of adjusting itself to repeated stresses without imposing strain on the bony portion; and because he presumes that when a first rib *is* broken it necessarily gives symptoms indicative of this accident. One sees every day, in routine chest pictures, abundant evidence of this adjustment process. In youth the adjustment is through the resilience of the uncalcified and springy costal cartilage. As this resilience is lost with increasing age the movements necessary to prevent the bone from fracturing when stress is applied are obtained by the formation of an arthrodial joint, either near the junction of the cartilage with the first rib, or near the junction of the cartilage with the sternum. Sometimes both of these joints are formed; and sometimes one first rib will show one type of "adjustment" while its opposite number shows another. (Asymmetry of the first ribs is common.)

The fact that fracture of the first rib can occur *without* pain sufficient to demand radiological investigation, or to incur a diagnosis of fracture of the first rib, is no argument in favour of the term "fatigue" fracture, parti- [illegible] the pain is severe and sudden, and in which, therefore, detailed study is made forthwith; and, in all reports of such cases I have been able to read, the evidence of sudden muscular pull on the first rib when it is taut, or even on stretch, seems to me to place the ætiology beyond question.

Alderson and I agree that fractures of the first rib (and, I would add, of its cartilage) are much more common than has hitherto been accepted, or taught. He believes [illegible] takes place gradually, through repeated [illegible] e I have demonstrated that this is not [illegible] certain that both of us welcome the [illegible] r observers. In conclusion I would like [illegible] Alderson on his work and to thank him [illegible] monstrating his excellent radiographs to me.

Manchester.   J. BLAIR HARTLEY.

INGUINAL HERNIA

SIR,—I read Lieut.-Colonel Brandon's article (Feb. 10) [illegible] nta- [illegible] ould [illegible] the [illegible] les, [illegible] tra- [illegible] r to [illegible] iere [illegible] ally [illegible] ? [illegible] sure [illegible] onic [illegible] onic [illegible] ture [illegible] onic prostatitis, and finally excessive [illegible] which causes a loss of elasticity and [illegible]. The enlarged prostate and carci- [illegible] a merit particular consideration. I [illegible] hat in the patients Colonel Brandon is [illegible] dom arise, for they are younger men.

In men of 65 or more the inguinal canal can be [illegible] by division of the spermatic cord and [illegible] of the testicle. In men between 45 and 65, [illegible] aster muscle and spermatic vessels may safely [illegible] ed and stripped down the cord so that they [illegible] outside the external ring. The testicle is then [illegible] ourished by the artery to the vas deferens. Having [illegible] erformed the operation many times, I offer this step as [illegible] rational one, which enables the internal and external [illegible] ngs to be reduced to the minimal dimensions. In no [illegible] se has it been followed by impairment of sexual [illegible] ower.

The possibility of there being two sacs at the same [illegible] me, which occasionally happens, demands notice. The [illegible] the surgeon [illegible] cavity and [illegible] a [illegible] diverticula. [illegible] y a direct hernia will occasionally be found [illegible] o be associated with a small oblique hernia and vice [illegible] ersa.

With regard to the remarks apparently referring to [illegible] he silver filigree inlays designed by McGavin, I think [illegible] hat the opinion of surgeons of his calibre, as well as of [illegible] ercival Cole and Campbell Milligan, expressed after [illegible] ong strenuous productive years, must be treated with [illegible] espect. There is undoubtedly a place for this remedy [illegible] here the conjoined tendon is wasted and degenerate.

Lastly, I would point out the need to clean the pillars [illegible] f the external abdominal ring down on to the face of [illegible] he os pubis—i.e., internal to the pubic spine. It is not [illegible] enerally realised that the external oblique is inserted [illegible] nto the anterior surface of the pubis and not into the [illegible] ubic spine, so it is possible in re-forming the external [illegible] ing for it to allow comfortable emergence of the spermatic cord without the risk of constricting it, and yet for the external ring to be internal to the pubic spine. This enables the surgeon to support the inguinal canal throughout its length by two layers of aponeurosis—i.e., transversalis and external oblique.

Since the war I have worked on the premise that every hernia [illegible] spective of size and age. [illegible] two recurrences out of nea [illegible] (they include a high proportion of men and women in middle and late life, the oldest 81). I submit that the policy for the medical profession, with regard to hernias, is that every hernia can be cured by operation and should be sent for such treatment as sc [illegible] patients the choi [illegible] be discontinued, [illegible] The ineffectiveness of trusses at ages over 65 makes life a burden.

The successful cure of a hernia pays a high dividend in comfort to the patient, and to those with whom he lives and works. It therefore merits our full attention. The cure-rate can be at least 95%.

London, W1.   HAROLD DODD.

SIR,—I am afraid that the simple fellow in Lieut.-Colonel Brandon's article on the House that Bassini Built (Feb. 10) is in for yet another disappointment. He did well to examine the foundations of the house which persisted in falling down, but had he examined as carefully some of the bricks from the ruins he would have made an interesting discovery. Instead of being a rich and healthy red, as the best bricks should be, he would have found that they had become yellowy-white and crumbly, and obviously inadequate material with which to attempt to build a wall. He may continue to build on his improved foundations, but his house will still fall down.

It has been my experien [illegible] after Bassini operations th [illegible] protruding through a wall c [illegible] once was muscle and is now unable to serve any useful function. It is relatively uncommon for the sac to come through between the muscle-that-was and the inguinal ligament.

If during a first operation for hernia the patient should cough, it will be observed that, although the arch of the "conjoined tendon" tends to flatten, it can be said in no way to apply itself to the inguinal ligament. It is therefore idle to pretend that stitching the muscle in question to the inguinal ligament merely anchors it in the position that it would normally occupy in contraction. The Bassini-type repair distorts and destroys muscle and does not provide an effective barrier. The answer to the question "And shall Bassini die?" is in my opinion "He is already dead, but he won't lie down."

BLA.   BERNARD L. WILLIAMS.

OUR TUBERCULOSIS SERVICE

SIR,—Dr. England (March 24) takes me to task for my constructive criticisms of the Joint Tuberculosis Council's recent report on *Reorganisation of the Tuberculosis Service*. I drew attention to the following omissions (here abbreviated):

> Provision of almoners; health education of the public; the problem of sanatorium staffing (nurses and domestics); health protection of staff; functions of universities in teaching and research; deficiencies in contact examinations; relation of the tuberculosis to the industrial medical services in regard to re-employment; and the financial allowances and mass radiography schemes.

Dr. England defends the above omissions on the ground that the JTC report was designed to deal with fundamentals rather than to provide a blue-print; that it was more concerned with principles than with refinements; and that concentration on particular aspects might have obscured the main problem. To attempt thus to differentiate between the character of the topics covered by the report, and that of the points in my [illegible] of omissions, is artificial; and, in fact, the report [illegible] with the particular as well as with the general [illegible] recommendations refer to standardisation [illegible] disinfection; modification of the term " [illegible] types of dispensaries, sessions, and rights of att [illegible] and nomenclature of radiographic reports. Are these points more fundamental than the omitted ones, and do not the importance and urgency of some, at least, of the latter make their omission inexcusable?

Then, too, the JTC, regarding almoners and mass radiography as "relative fledglings in the tuberculosis world," believe that "it is a little early for the council to offer guidance in these matters." Surely the contrary is the case. Mass radiography is in an experimental and fluid stage, and it is just now that the JTC have an excellent opportunity of seeing that it develops along the right lines.

As a delegate body, the JTC can voice the opinion of tuberculosis medical workers, and I ask Dr. England to believe that my original letter was intended to suggest ways in which the council might better assist in solving both the immediate and the long-term problems of reconstruction in this special field.

OBSERVER.

GENITAL PROLAPSE

SIR,—I was interested to see Dr. Clare's paper in your issue of March 3 describing the operation for genital prolapse. This operation appears to differ in no essential detail from that performed by Paramore of Rugby which he demonstrated to me in 1928 and which I have been in the habit of performing since that date.

Great Bookham, Surrey. NOEL E. WATERFIELD.

IRON OXIDE DUST

SIR,—The article by McLaughlin and his colleagues (March 17) reviews the literature of siderosis. In discussing the relation between the X-ray appearances and the pathological anatomy of the lungs of workers who have inspired the dust of iron oxide the following notes may be of interest.

In *Tubercle* for October, 1937, I published a paper on blood examinations in pulmonary fibrosis of hematite iron ore miners in which I stated, with pathological evidence, that the X-ray appearances in a large number of cases were due to hematite accumulations without fibrosis. This was the first authenticated statement to this effect. O. A. Sander of Wisconsin, in a personal communication to me (February, 1938) before he published his paper with Enzer, said he also had found an absence of fibrosis post mortem in cases of welders and hematite miners. I quote his subsequent statement:

> "Until these observations, we had not believed that iron accumulations within the lymphatic nodules could cast shadows without an associated fibrosis. We were pleased, therefore, to see your statement on this point, which to our knowledge is the first to appear in the literature with definite proof that the iron and not fibrosis is casting shadows in some of these cases."

The question of simple retention of iron oxide in the lungs without collagenous or at least reticular reaction is a difficult one to settle; but in my opinion the presence of iron in amount sufficient to cause a radiological shadow implies that there is tissue reaction somewhere in the pulmonary lymphatic system.

McLaughlin and his colleagues note that the hilar glands are enlarged and contain much iron. They do not mention whether fibrosis was present, which would suggest the presence of silica. In the many lungs of hematite miners that I have examined post mortem in the last ten years, accumulation of iron was often present throughout the lungs without reticular change; but diligent search in subpleural locations will usually disclose very small imperfectly formed nodules with scanty primitive collagen. This does not alter the conclusions which are drawn regarding the general lung picture, and which I described in 1937, but it does show that the reaction is essentially a response to silica.

To prove that the condition is due entirely to the presence of non-irritant iron, there should first have been a silica estimation of the dust, and secondly a silica estimation of the lung ash. Without this it is impossible to conclude that silica does not enter into the problem. *A short time ago I saw a case of undoubted* pulmonary fibrosis in a man who had been a rouge packer for 40 years. This powder contained a considerable amount of silica, which strongly suggests that the [illegible]tion is silicosis.

I contend that dust retention within the human lung is probably always due to an irritant, which is probably always silica. These cases are not silicosis, or even fibrosis, to the extent of being clinically or pathologically significant; but we need much more proof before concluding that such a condition is due entirely to the presence of innocuous iron oxide. A statement of mine on this problem is at present in the press (*Proc. R. Soc. Med.*).

J. CRAW,
Medical Officer to the Cumberland
Hematite Mines.

Whitehaven.

APHORISMS

SIR,—It occurs to me that it would be interesting and instructive to make a collection of medical, surgical, and gynæcological aphorisms. So far as I know, no book of this kind has been published. If any of your readers would care to send me aphorisms which they consider useful, I should be glad to have them. The source of each should if possible be stated.

Watlington, Oxford. T. LIONEL CRAWHALL.

WHITER BREAD

SIR,—The sudden change on the Bread Front was to say the least surprising. Your careful report (March 10) of the discussion in the House of Lords and the explanations given by Lord Woolton leave one disturbed and curious as to the grounds for such a momentous decision. According to Lord Woolton it was taken after a visit he paid to one research station of the Ministry of Food. The Scientific Advisory Committee, from whom one would have expected Lord Woolton to seek confirmation of what he had just been told, were, he states, not consulted. Nor was their approval of the steps he was to take obtained later. Nor, according to your report, were the millers consulted. That surely requires amplification. The Cabinet would not (one hopes) have altered the composition of petrol or of concrete without first obtaining the approval of the manufacturers concerned. It all does not seem real, or sense.

Whatever the actual cash value of the extractives which the millers are again to be allowed to sell separately, and admitting that (as Colonel Llewellin informed the House of Commons on March 21) the change is not to their financial advantage today, since they are paid by a "management fee," the fact remains that conditions will be different after the war. And the millers are not unable to take a long view.

Grimsby. S. W. SWINDELLS.

PENICILLIN IN BACTERIAL ENDOCARDITIS

SIR,—Since the announcement made in these columns (Feb. 17) of the formation of ten centres to investigate the value of penicillin in the treatment of bacterial endocarditis, three further research centres have been formed, in Newcastle, Birmingham, and Glasgow. Physicians are invited to refer patients suffering from subacute bacterial endocarditis to:—

Prof. F. J. NATTRASS,
Royal Victoria Infirmary, Newcastle-upon-Tyne.
Prof. K. D. WILKINSON,
Queen Elizabeth Hospital, Edgbaston, Birmingham.
Prof. J. W. MCNEE, or Dr. W. R. SNODGRASS,
Western Infirmary, Glasgow.

RONALD V. CHRISTIE.
Secretary, Penicillin Clinical Trials Committee,
Medical Research Council.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.—The society is holding its annual congress at 1, Wimpole Street, London, W1, on Friday and Saturday, April 13 and 14. At 10 AM on Friday, Air Vice-Marshal C. P. Symonds and Squadron-Leader A. G. Cross will open a discussion on the ocular sequelæ of head injuries. In the afternoon at 2.30 PM there will be a joint meeting with the ophthalmological section of the Royal Society of Medicine, when Wing-Commander J. H. Doggart will read a paper on macular derangement and Mr. Joseph Minton one on vision and selection of personnel *in industry. On Saturday, at 9.30 PM, there will be a discussion* on plastic repair of the lids, to be opened by Major H. B. Stallard and Mr. John Foster. At the afternoon session, at 2.30 PM, Mr. E. Wolff, Dr. A. Lowenstein, Mr. Frank Law, and Dr. G. F. Alexander (by proxy) will read short papers.

On Active Service

CASUALTIES

WOUNDED

Captain John Brackenridge, MB EDIN., RAMC
Major J. L. Nicol, MB ABERD., RAMC
Lieutenant A. J. J. Stone, RAMC

AWARDS

OBE

Lieut.-Colonel H. W. Featherstone, MD CAMB., RAMC

MBE

Captain O. S. Hetherington, MB NZ, NZMF

MC

Major E. G. Wilbraham, MRCS, RAMC
Major Ian Affleck, MRCS, RAMC
Captain J. O. Forfar, MB ST. AND., RAMC
Captain A. G. S. Hill, MB EDIN., RAMC
Captain S. S. Nazir, MB, IAMC

MENTIONED IN DESPATCHES

RAMC.—Major-General Sir Percy Tomlinson; Brigadier E. Phillips; Colonels D. L. Kerr, W. H. Marston, P. E. D. Pank, J. H. C. Walker and R. F. Walker, Lieut.-Colonels C. W. Arnot, C. Bainbridge, C. E. Gallagher, A. F. Kennedy, N. J. Logie, T. F. Main, J. J. Myles, W. P. Purvis, J. M. Scott, J. L. Warner, F. W. A. Warren, G. N. Wood, R. D. Jones, G. M. Robertshaw, J. Smith; Majors C. R. Clayburn, C. H. Davies, J. O'Kane, W. G. Bateson, D. E. H. Beattie, R. A. Binning, J. Clay, H. A. Constable, D. O. Davies, A. S. Dill-Russell, W. N. Douglas, R. G. Evans, F. S. Fiddes, T. F. R. Griffin, F. M. Hanna, J. Hoile, D. F. Hutchinson, W. B. Hynam, R. N. Lees, J. B. MacKay, J. Millar, J. A. V. Nicoll, D. N

A. F

Wils

Balmer, E. S. Bompas, (Qr.-Mr.) H. V. Brennan, W. J. Cameron, A. J. Clarke, H. Conway, P. W. M. Davidson, R. Dobson, R. C. Droop, J. O. Forfar, J. G. Gant, C. N. Hibb, R. D. Glaister, F. I. Herbert, E. K. Hole, C. G. Irwin, L. P. Lassman, H. J. C. J. L'Etang, A. W. B. Macdonald, B. Maddison, M. Makin, T. S. Maw, L. H. H. May, D. G. McConnell, J. L. McNeill, C. W. Mearns, A. D. Milne, A. D. Payne, W. Rankin, R. L. Rees, S. McR. Reid, H. A. Ripman, N. C. Rogers, G. F. Shaw, G. M. C. Smith, A. U. Somerville, G. K. Spruell, R. T. Thin, I. F. Thomson, C. H. Watts, H. L. Waugh, and C. F. Young; Lieutenants W. N. Coombes, R. A. Green, J. S. Hayward, J. A. Hogarth, and R. H. A. Ledgard.

MEMOIR

Captain J. R. Sweeting, RAMC, was killed in action in Burma in January, while serving with the secret V force whose medical officer he had been since 1943. Born in 1910, the elder son of Mr. H. R. Sweeting, he was educated at Wellingborough School, where his father was a master. In 1935 he took the Conjoint qualification from University College Hospital, and after holding house-appointments there, and at the West London Hospital, he settled in practice with a firm at St. Ives, Hunts. At the beginning of the war he joined the RAMC and for a time was in medical charge of a hospital ship in the Channel. After some months of office work at Southampton, and later at Liverpool, he was promoted captain and posted to a field ambulance, with which he later went to India. In the following year, though he knew this eant missing promotion, he volunteered for service with the force. "John was a left-hander," his father writes, "who arned at first to write right-handed and so became ambixtrous. He could dissect and operate with either hand, and as the despair of nurses in the operating-theatre until they asped that everything had to be ready for him on both des. Rather serious in manner, he was willing to work to e limit for what he really wanted, and he was completely appy at St. Ives when he found he was being really useful." member of the Cambridge Amateur Flying Club, he was a ten pilot; and, by contrast, he was also a patient and skilful ngler.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

On the assembly of the House on Wednesday Mr. Churchill gave a brief but masterly historical retrospect of Lloyd George's great career. Many other tributes were paid, and members then turned to the task of the present—a giant task, needing great courage.

It is clear from abundant evidence from many sources that the economic and especially the food and health situation in Europe is very serious. Speaker after speaker added statement after statement which showed that we have come only to the beginning of understanding its gravity. Lord Winterton said there was much pre

of future

stock of

trucks, I

are using a very large proportion. Two million tons of merchant shipping out of three million have been lost, and of the million remaining 800,000 tons is in the Allied-shipping pool. The needs of war compel this, but the strain on transport for civil needs is severe. In Belgium and liberated Holland the picture is similar. In the parts of Holland which are still occupied the colours are darker still: we hear of men and women stumbling out of the foodless cities into lanes and roads in the countryside and dying by the roadside from exhaustion and starvation.

Mr. Greenwood saw the problems of Europe as not only those of food but of raw materials for food, such as seeds and fertilisers. "Our treatment of the liberated areas," said the Labour leader, "our sense of urgency, our desire to go to their assistance" will be the test of the sincerity of our war aims.

Mr. Attlee, Deputy Prime Minister, who recently visited France and Belgium at the request of the War Cabinet, indicated that a good deal had already been done to help, and more was in prospect. We are supplying over 400,000 tons of raw materials; locomotives and

actual needs are being met but that the situation is critical and requires active watching.

Sir Arthur Salter, until lately second-in-command of UNRRA, spoke of the disillusionment about that body. Fifteen months after its creation it is *not operating on its own responsibility* in any liberated area. He thought it had started too early, was organised too cumbrously, and was advertised too enthusiastically. What was needed now was a Supreme Reconstruction Council. Dr. Haden Guest said we had had to pass *through the* period of phoney war to an understanding of the realities of war, and we were now in a period of phoney peace. An Economic General Staff for Europe would be essential because, when

Denmark, Poland,

the huge problems

more serious than anyone has at present realised.

The Secretary of State for War wound up the debate, and he had no very cheery message to give. We would face the situation in Europe and use *all measures* reasonable and possible to cope with it. But in view of the world shortages it was very grave indeed.

FROM THE PRESS GALLERY

Relief for Liberated Countries

In the House of Commons on March 28 Earl Winterton spoke of the urgent need for giving succour to the liberated territories of Western Europe. The tremendous successes of the Allied armies, he said, had exacerbated rather than diminished the problem, because the immediate power of Germany to produce food and goods was being rapidly destroyed and large masses of her population would soon be wandering homeless and without sustenance. The Allies would feel a great responsibility in this matter after the occupation of Germany. High Allied authorities had assured him that the economic condition of the free Western countries was very serious. It was impossible to exaggerate the mental, physical and spiritual strain that the people had gone through. Most of the psychological troubles in those stricken areas arose not only from the conditions of German occupation but also from the terrible lack of proper nutrition which had reduced their physical powers and almost abolished their powers of moderation and judgment. He believed that the great Allied Powers had been caught short: they thought that the war would be over sooner, and that was one reason for the lack of transport which interfered with the distribution of relief. But even if transport was found, where was the necessary food? He did not think this country could spare any at this moment. According to his information the United States Army rations were about twice those of the British in quantity. They were about four times those of the British civilian, and nine or ten times those of the average civilian in France. He understood that under the Hague Convention when German prisoners were captured the private soldier had to be given more or less the same rations as those received by the American GI. If this was true, it must cause ill-feeling in France, and he was convinced that the situation would have to be dealt with drastically. Moreover, when we got into Germany were the prisoners in the cages going to be given all the food they wanted while the starving population got nothing?

GOVERNMENT AND CRITICS

Mr. **Arthur Greenwood** thought that the headquarters of UNRRA ought to be in Europe. It was doubtful whether there was enough food in the world now to satisfy the reasonable needs of the world and to succour the devastated areas. If we had to tighten our belts again to fulfil our obligations of honour, we would do it, but we were entitled to appeal to the great food-producing countries to come to the aid of the starving peoples in the west of Europe. Unless food was brought quickly there would be famine and death in those areas. The problem was complicated by the breakdown of normal food production and transport in Europe as well as the breakdown of the health services in many countries. On the health side the first need was food.

Mr. **Attlee**, Lord President of the Council, said that the responsibility for the provision of supplies to the people of the liberated areas rested on the military authorities whose duty was limited to meeting minimum needs. The further our armies went the greater became the difficulties. Nevertheless the picture had its lights as well as its shades; generally there was something more than bare rations in the agricultural areas. Considering the difficulties, the military authorities had done good work. In the case of heavy workers the minimum standard had to be supplemented, but it was sufficient to maintain health, and up to now there had been a remarkable freedom from epidemics. It was against the world shortage that the picture of the liberated areas and all Europe must be viewed. It was a very dark picture. In occupied Holland the Germans were giving the people only about a quarter of the standard allowed in free Holland. Preparations were being made to feed the people as soon as we got into occupied Holland, but there would have to be specialised foods for those who were very near starvation. He agreed with what had been said about conditions of life inside Germany: we must do our best, but our friends must come before our enemies. Britain had reduced her stocks of food to what the Government believed was the limit of safety. Our own regular rations were on a very modest scale, and big reductions in them could not be made without affecting the war effort. In any event, what we could for a time cut from our rations would not really meet the need. But within the limits of our power we would do our share to help our friends in the liberated areas.

Sir **Arthur Salter** said that as far as he had been able to ascertain, the normal rations for the normal person in France were not more than half our own not excessive rations. The chief anxiety was not so much the conditions in the liberated countries as the situation when victory was complete and the whole of Europe became the responsibility of the Allies. He agreed that our friends must have priority, but nevertheless the feeding of the German population would become a responsibility. What was urgently needed was a superior authority able to the Supreme Economic Council established in 1919, differing only in that he hoped it would be created with less delay, and would have wider authority inasmuch as the task was greater.

Mr. **Graham White** said that Mr. Attlee's speech left him doubtful whether the gravity of the situation was fully realised. The Allies would fail utterly if they failed in the first instance to rehabilitate and feed the displaced populations.

Major **Mott-Radclyffe** said that no-one who had seen in liberated Europe the results of malnutrition could have any illusions as to the urgent need of relief. But we must remove from the minds of those in the liberated countries any misunderstanding of our capacity to relieve them. We ought to state clearly that we would render all possible assistance but our resources were not unlimited, and that as soon as the war with Germany was over the war in the Far East must be a first-priority call on our shipping. Coöperation with our Allies could alone enable us to tackle successfully the colossal problem of rehabilitation in Europe.

Dr. **Haden Guest** said that a supreme staff was needed in Europe, but the valuable personnel and information possessed by UNRRA should not be thrown away: it should be utilised as the Civil Service of the supreme economic staff. UNRRA was excellent, but it had not power and authority. The food situation has been deliberately engineered by the Germans. The question not only of the nutrition and ordinary feeding of the people but of the political stability of the liberated countries was very serious. Unless we could make a plan to feed and rehabilitate these countries on a big scale—unless we set up an economic staff for dealing with the civil aspect of the war on a scale as large as the staff required to plan D-day for military operations—we should not get out of our difficulties for many years to come. It was true, as Mr. Attlee had said, that there had not been epidemics up to the present, but the soil in which epidemics grew was being spread all over Europe at present. UNRRA could not handle this problem; nothing but a staff organisation, with a standing equal with Governments, could possibly handle it.

HOLLAND

Sir **Ralph Glyn** said that of 4½ million people in the western districts of Holland it was safe to assume that 1 million would not be physically able to digest ordinary foodstuffs. Experience in the Bengal famine showed that in Holland it would be necessary to distribute predigested food. The scheme for bringing Dutch children to this country was working well. It was essential, however, that the children should first go to hostels in order that they might not be killed by kindness. After a sojourn in the hostels, when they were able to take ordinary food, they could then be passed on to British families.

Mr. **Emmott** said we might create at San Francisco or elsewhere the most excellent machinery of peace; but if there were in the world millions of human beings on the verge of starvation, or already starving, all this work would be of no avail.

The Government's Housing Policy

The gravity of the housing problem was well brought out in the two days' debate in the House of Commons on March 22 and 23. Members of all political parties were for the most part highly critical of the white-paper (*Lancet*, March 31, p. 412).

STATEMENT BY MINISTER OF HEALTH

Mr. **Willink** admitted the urgent need, but said that the period ahead must be a time of great difficulty. The Government had not made, and did not intend to make, promises which they had no chance of fulfilling. A programme beyond the capacity of the building industry merely meant that many houses were started and few finished; prices were forced rapidly upwards and programmes downwards. That was what happened in 1921. The only fair test of the white-paper plan was: Was this the best possible programme of actual house-building to be carried to completion in these two years, bearing in mind the facts (1) that, for part of the time at least we should still be engaged in a major war which must continue to have first call on all our resources, (2) that there would be an intense shortage of building

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In many parts s unusual. A ated during these six ntenance and repairs, amage repairs? In the s estimate of what could ted in the first two years
appered or ch 1805 and after plus temporary houses and
repai sickness thology to s a tremendous commitment.

The Gover[illegible], Mr. Willink declared, proposed to treat these two years as a period of national emergency requiring exceptional measures. The short-term programme set out in the white-paper was the biggest which the Government could present as capable of realisation. But if more houses could be built they would be built. The possibility of using alternative methods of house construction required further experiment, and during 1945 a number of methods were going to be thoroughly tested. Groups of houses—50 or more in each case—were to be built by the Ministry of Works in cooperation with firms and local authorities. These experiments would be followed as soon as possible by large-scale [illegible] of houses on the systems found to give the [illegible]s. The temporary houses were the one and [illegible] of giving this year a quite substantial increase in the number of separate houses. Deliveries of timber-framed houses from the United States might be expected in May.

In conclusion Mr. Willink said it was reasonable to hope that by the end of the emergency period there would be an expanded building industry capable of overtaking arrears. Efforts should then be turned to the continued improvement in the standard of housing on which this country had embarked before the war and which meant so much to the happiness, comfort, and health of our people. (Cheers.)

COMMENTS

Mr. **Arthur Greenwood**, the Labour Opposition leader, was caustic in his comment. The white-paper was mere "chicken feed" for a hungry nation, like Mr. Willink's speech. The time wasted in the last three years would not be recoverable in the next ten years. The problem had been seriously mishandled. It was clear that bomb-damaged areas must receive attention first, but the repairs being done to some of the houses at present were not very good. Next winter a large number of people in this country would need shelter. If after six years of war this country was going to run into a situation where people had only the roughest shelter over their heads there might be grave social disturbances. —Captain **Cobb**, from the Conservative benches, said he did not believe that the Government appreciated how deeply public opinion was disturbed. It was felt that no real progress would be made until there was one Minister having sole responsibility for housing. He could not believe that at this stage of the war it was impossible to find some labour from the munition factories.

The rest of the first day's debate ran on similarly critical lines. Very generally there was a demand for a single Minister to be in charge of housing; for a drastic policy designed in accordance with the seriousness of the emergency; and for a much more thorough comb-out in order to produce the requisite labour.

In the second day's debate Mr. **Bossom** said we had reached a state of emergency, and if we did not satisfy the people's needs there would be disaster. It was [illegible] the present arrangements. [illegible] and 1500 local authori[illegible] [illegible] even cities had their own [illegible] was essential that the [illegible] the full-time attention of [illegible] [illegible]ERSKILL remarked that so far the country had been fed on promises and targets. The seeds were being sown of a major domestic crisis. Mr. **H. Molson**, however, thought the time had not yet come when young man-power could be diverted from the Armed Forces to building, and he hoped the Government would not change their policy of putting the war first. The real solution of the housing problem after the war was to be found in new and improved building methods and in obtaining a greater output per man.

Mr. **L. Silkin** held that the programme for temporary houses was unsatisfactory, and a long-term programme was non-existent. No real policy was possible until the Government tackled the question of the control of land. The Prime Minister had started with a promise of 500,000 temporary houses, but since then there had been three changes in figures, all downwards.

GOVERNMENT'S LATEST PLANS

Winding up the debate, Mr. **Duncan Sandys**, Minister of Works, made important new announcements. The services of General Sir Frederick Pile had been made [illegible] ieral, to organise [illegible] the Government [illegible] would be chief [illegible] coördination of experimental and development work. The heads of the four sections of the Ministry, together with the Minister and the Permanent Secretary, would form a Council of Works. Research, planning, and organising would not, however, produce the results needed without the requisite building labour. So long as the present heavy programme of repairs continued, not much more than 10,000 men could be spared for the temporary and permanent housing programme. As soon as Germany was defeated, however, a start would be made with the expansion of the building industry to about 1,250,000, and within a year of the end of the war in Europe it was hoped to raise the building force from its present figure of 337,000 to 800,000. Inquiry was being made into other methods by which the man-power of the building trade might be reinforced. Among thes[illegible] was the extended employment of women to assi[illegible] directly or indirect[illegible]
It was hoped that by [illegible]
would be erected. [illegible]
steel two-story permanent houses in place of the tem-
porary bungalows was being examined, and alumi[illegible]
houses had now passed their technical tests. H[illegible] the
hopeful that several types of permanent house[illegible] not,
by new methods would be in production in th[illegible] In a
spring of next year. vitably
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QUESTION TIME

Artificial Insemination

Mr. **Driberg** asked the Minister of Health in ho[illegible]
clinics and by how many physicians experiments [illegible]ciation
being conducted in the artificial insemination of [illegible]
how many children had been or were expected short which
born in Britain as a result of such experiments; how [illegible] from
these children were the offspring of their mother's hu[illegible]cond
how many of anonymous donors; and in the latter case It
the facts were recorded in the register of births.—Mr. [illegible]vo
Link replied: I have no information as to the first part[illegible]
the question beyond what has appeared in the medical p[illegible]
from which I understand that artificial insemination has bee[illegible]
carried out at a voluntary clinic at Exeter. So far as I am aware no births have been registered as resulting from artificial insemination.

Mr. **Driberg** asked whether the Minister would bear in mind the very serious development of this artificial insemination and its tremendous social and legal, as well as its scientific, implications: and that it had great possibilities and great dangers. Would he call for a report from the physicians concerned and acquaint the House of Commons of the facts?—Mr. **Willink** said he would consider that, but he doubted if he had powers to call for a report from physicians acting in a private capacity.

Mr. **Ivor Thomas**: Cannot this subject be added to the terms of reference of the Royal Commission on Population?—Mr. **Willink**: I doubt if that would be the appropriate body.

Mr. **J. J. Lawson** asked if the Minister was going to allow a practice of this sort to be uncontrolled.—Mr. **Willink** said he would consider what steps could be taken to obtain the desired information.

Nutrition in Newfoundland

Mr. **Edgar Granville** asked the Under-Secretary of State for Dominion Affairs if he was satisfied that the present position of food-supplies in Newfoundland was adequate.—Mr. **P. V. Emrys-Evans** replied: Arrangements were made in 1943 whereby the Canadian and United States governments, in concert with the Newfoundland government, undertook to meet Newfoundland's war-time food requirements on t[illegible] basis of imports in a normal pre-war year, plus 20%, to all[illegible] for the increase in the war-time population. These arr[illegible] ments have worked satisfactorily in general, and are combined with a rationing system covering tea, sugar, and evaporated milk. Experience has shown, however, that there is a certain lack of balance in the normal diet of large sections of the Newfoundland people. Steps, including the fortification of flour and margarine, have been taken to correct this, and to assist them in nutrition matters the Commission of Government last year invited a committee composed of dietetic experts from the United Kingdom, Canada, and United States, to undertake a survey in the island. The preliminary findings of this committee revealed that, in the limited area which they visited, many of the cases examined proved to be suffering from nutritional deficiencies. The report of the committee is now being studied by a special nutritional council which the Commission have set up. Measures are already in progress to bring home to the people of Newfoundland the benefits of a more varied diet.

Obituary

GEORGE LEES TAYLOR

M D MANC., PH D CAMB., F R C P

The death of George Taylor on March 9, at the age of 47, is a severe blow to the progress of serology, particularly that increasingly important branch which deals with blood-groups and the prevention of reactions to qulood-transfusion. At Manchester University in 1920 douaylor gained distinctions in anatomy, pathology, and nowrgery in his MB, and won the Dumville surgical prize. succter a series of house-appointments, under Sir William beltsorburn and Prof. George Murray among others, he do itered general practice, but in 1929 he took up research produthe precipitin reaction under Prof. H. R. Dean at peoplesridge, where he held the John Lucas Walker quickly tship. In 1930 he took his MD at Manchester The prommendation and in 1932 his PhD at Cambridge. normal fo he was elected Rockefeller research fellow in as the bre at the Galton Laboratory, University College, tries. Or where he worked under Prof. R. A. Fisher.

Mr. Aroutbreak of war the Medical Research Council the resped him with the production of blood-grouping people of war purposes, and he became the head of the authoritiserum unit which was later transferred to the needs. Inent of Pathology at Cambridge. Since 1939 the diffict has produced high-quality grouping serum for as well vilian and Service units which have been unable to more the their own. It has established standards below siderina no serum used for this purpose should fall. The good has also become accepted as the reference laboratory standwhich other workers in this field have sent difficult to a for further study and confirmation of unusual remdings. The willingness of George Taylor and his associates to help less experienced colleagues with advice, with additional supplies of rare but essential sera, and with their own experience, has contributed much to the successful development of British work on blood-groups in the last five years. Apart from routine duties essential to the war, the unit has achieved a remarkable output of research work, particularly in relation to the rhesus factor. Few people have had the satisfaction, while still doing a war job, of adding so much to the body of fundamental knowledge as Taylor and his team. In 1944 he was elected FRCP.

Taylor was memorable in any company. He had the vigour of character and the brevity of witty speech often associated with Lancashire and he had all the Lancashire common sense as well. Characteristic of him was a whimsical humour which was turned more often against himself than against others. He was always thoughtful for those who worked with him, and for a much wider circle also, and apt to neglect his own advantage. G. L. recalls his short, square figure, slipping through the lunch-time maze of Cambridge bicycles with the whimsical, half-anxious smile which came to be his habitual expression. "You had to know him well," he writes, "to realise that whatever cares he had were primarily cares for the welfare of others; and that the determination of his character was sustained by a warmth of feeling which sought, in general practice as well as in research, to alleviate the sufferings of his fellows. If the motive of ine is service and not personal gain, George Taylor a good doctor."

BENJAMIN ARTHUR RICHM

M D LOND

The pattern of Dr. Richmond's life wa brilliant student at Guy's, he qualified in demonstrating chemistry, physics, and pa low students was awarded the gold medal for his London MD thesis on the X ray and its possible use in diagnosis (1907). After several hospital appointments he joined the famous firm organised by Dr. Alfred Salter, MP, to provide medical treatment for Bermondsey and Rotherhithe. This mixed general practice was a practical example of social medicine, for the partners lived over their shops and saw the problems of a crowded urban community at point-blank range; and during these years Richmond was closely associated with the Rev. J. Scott Lidgett at the Bermondsey settlement. When the National Health Insurance was introduced he becan secretary of the London Panel Committee, and in t capacity served on the Central Medical War Committee throughout the last war. Afterwards he accepted the invitation of the Ministry of Health to be one of their first regional medical officers, at first for Kent, Surrey, and Sussex, and later for Staffs, Salop, and Worcester. Th appointment then meant holding the scale evenly between insured person and approved society, acting in effect as consultant to the panel doctor and the insurance agent, and Richmond regretted that settling disputes about entitlement to benefit came to occupy so undue a proportion of his time. Nevertheless he learned how official machinery could be adapted to meet personal needs. He had a high degree of horse-sense combined with an innate sympathy for people in difficulties, and his decisions were rarely questioned. He retired in 1935 with failing eyesight after an attack of glaucoma, but the buoyancy which had made him such a good companion on a holiday continued, and at his Caernarvonshire home he enjoyed his garden and the pleasures of the countryside. He died at Trefriw on Feb. 26.

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JOHN DOUGLAS HOPE FRESHWATER

M D CAMB.

Dr. Douglas Freshwater was educated at Westminster and at Cambridge University, entered St. George's Hospital in 1900 with a scholarship, and qualified in 1903. After holding house-appointments, he decided to make dermatology and syphilology his life's work and spent a couple of years in postgraduate study abroad, chiefly in Germany. He returned to St. George's in 1905 to take up the post of clinical assistant to the skin and venereal diseases department and also to a newly created department of actinotherapy. He was appointed assistant physician to the skin department in 1923 and physician in 1926, and he held this post until 1942 when his health was already showing signs of failure.

When Freshwater went to St. George's, students still arrived daily for their duties in top-hats—a practi which finally lapsed after the war of 1914—and througout his life he retained an air of sartorial distinctio which accorded with his handsome appearance. Fo 37 years he practised his specialty in Wimpole Street as well as giving fully of his time to his hospitals and medical school. Besides his family, to whom he was devoted, he had many and varied interests, including the drama, motoring, bridge, and lawn-tennis, which last game he played very actively till well over fifty. He died on Feb. 7 at the age of 69.

The Dentists Register for 1945 contains 15,438 names, which 285 were added during the previous twelve month This is the smallest increment since 1932. In all, 295 name were removed last year, 188 on evidence of death, while 44 were restored. Two names have been added to the foreign section, but the total remains constant at 176.

Notes and News

THE MISSIONARY FIELD

In many parts of the world the growth of civilisation is [illegible] ease. Malaria, bilharzia, and [illegible] a race more severely than any [illegible] back. Against the monstrous [illegible] any tropical countries medicine [illegible] s. In a recent book Canon J. McLeod Campbell,[1] writing of the work done and still to do by medical missions, speaks for 17 societies of varying theological outlook. He explains the great and continued need for men and women doctors in stations where tropical diseases call for study by those with the best brains and the fullest energy for administration. He does not discuss whether this task is more properly that of the government medical services in such regions: the fact is that at present the two services work side by side, and still cannot meet the demand. Writing of the Southern Sudan he describes a hospital with fourteen [illegible] many beds as all the London teaching hospitals together. The keynote of his appeal is sounded in a quotation from Dr. Janet Welsh of Nyasaland: "... our medical contribution is service. Dirty, lonely, unpleasant, uncomfortable service, the mission hospital stands for that. We are primarily practical workers to demonstrate Christianity in action in daily work."

GREYBEARDS AT WORK

Self-interest may well reinforce altruism when it comes [illegible] the needs of the aged; for, as Filch said of the [illegible] what we must all come to." In 1940 the [illegible] f Social Service established an old people's [illegible] which after four years' work has gathered [illegible] he agencies founded to study the needs of [illegible] promote measures for their well-being. The war has seen a change in the attitude to old people, and in the financial and social provisions made for them. Even if [illegible] and by closer study of the ills of old age and their relief. Better diet and a healthier environment during the heyday of working life, it is suggested, will mean sturdier elders who will not care to retire at sixty.

REHABILITATION OF E. BANCROFT

A man whose activities embraced medicine, natural history, [illegible] philanthropy, novel-writing, and research into [illegible] have been thankful to have his evenings to [illegible] et so mixed were the elements in Dr. Edward Bancroft, FRS, that during the American War of Independence he seems to have undertaken espionage for both sides. In reviving the memory of this genial rascal Sir Arthur MacNalty has treated him perhaps with more mercy than justice (*Proc. R. Soc. Med.* 1944, 38, 7). Born in Massachusetts in 1744, Bancroft gained some medical training and served for a [illegible] as doctor to plantations in the West Indies and Dutch Guiana. Here he began his studies of plant dyes, and wrote a useful book on natural history. Round about 1766 he came to England, took his MD degree, and settled down as a successful London physician. The value of yellow oak for dyeing was his personal discovery; he gave it the name of quercitron, from *Quercus citrini*, and it remained an important dye until recent times. He was elected a fellow of the Royal Society in 1773 on the strength of these studies, and a year or two later he obtained a Government patent licensing him to "make, use, exercise, and vend" his dyes.

By 1775 the War of Independence had begun. Bancroft, who had lived ten years in England and expected to end his life there, was on the whole sympathetic to the British cause. Chance brought him into touch, in Paris, with Silas Deane, the first diplomatic representative of the United States, and he learned of the secret negotiations of the colonists with the French Government. He passed this news on to the British Secretaries of State—not an unnatural action considering the trend of his loyalties. But he was not allowed to stop at that; he was urged "to watch and disclose the progress of it." Complying, he made several journeys to Paris and corresponded freely with Deane (who thought the Colonies owed much to Bancroft), giving him gossip and trivial political information. "And in this way I became *entangled* and obliged to proceed in a kind of Business, as repugnant to my feelings as it has been to my original intentions," says he. Repugnant or not, he was not deterred from accepting "such emoluments, as my situation indeed required."

Sir Arthur believes that the businesslike doctor was sincerely anxious for a reconciliation between Britain and her American colonies, and would like to show him as one whose advice might have preserved a world-wide English-speaking nation. But it is not very easy to credit Bancroft with much foresight except where his own interests were concerned. Fortunately we may dismiss his dubious practices with the reflection that the American War of Independence has turned out very well for everybody.

LISTS OF MEDICAL FILMS

The Royal Society of Medicine and the Scientific Film [illegible] the catalogues of the Central Film Library, British Film Institute, Scientific Film Committee, and Kodak's. Titles are grouped under subject headings, and hiring charges are given, as well as the date of production when known; but the catalogue quotes films whether they are easily available or not, and gives no information about content or quality. In a modest foreword the BMSA point out that it will inevitably contain mistakes (a prophecy which is confirmed) and go on to say that "no programme should be planned only on the information given." Though their list is incomplete they are to be congratulated on a courageous venture, which has involved much hard work.

The medical committee of the Scientific Film Association have published a second *Handlist of Recent Medical Films*[2] giving particulars of 12 films, most of them recent, which deserve to be widely seen. We have also received from the American Film Centre of New York a copy of the second supplement to their list of health and medical films. It gives brief descriptions of some health films which have become available recently in the United States, including a few of our Ministry of Information films.

Royal College of Surgeons of England

Queen Mary has made a donation to the restoration and development fund of the college.

The following lectures will be given at the college, Lincoln's Inn Fields, London, WC2, at 4 PM during April:

Hunterian lecture.—Mr. H. S. Shucksmith, abdominal injuries in battle casualties (April 6).

Robert Jones lecture.—Prof. F. Wood Jones, FRS, some reflections on his teaching of myology (April 12).

Thomas Vicary lecture.—Surgeon Rear-Admiral G. Gordon-Taylor, the medical and surgical aspects of the Jacobite rising of 1745 (April 16).

Hunterian lectures.—Mr. D. M. Stern, prolapse, with special [illegible] e (April 18); Squadron- [illegible] s of the face (April 23); [illegible] ic surgery (April 25); [illegible] of skin for autogenous [illegible] appendicitis (April 30).

Medical Society of London

On Monday, April 9, at 5 PM, at 11, Chandos Street, W1, Mr. W. Sampson Handley will open a discussion on the deferment of senescence.

National Institute for the Deaf

The annual general meeting of the council will be held at 105, Gower Street, London, WC1, on Friday, April 13, at 2.30 PM.

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[1] Medical Man Power in the Twentieth Century Church. Canon J. McLeod Campbell. Press and Publications Board, Westminster, 2s. 6d.

[1] A Guide to Documentary Films on Medical Subjects. Obtainable from the Secretary, BMSA, BMA House, Tavistock Square, London WC1. 1s.

[2] Copies may be obtained from Dr. S. J. Reynolds, 14, Horton Road, London, SW16.

University of Liverpool

At recent examinations the following were successful:

FINAL EXAMINATION FOR MB, CH B

Part I.—F. G. Anderson, Olive M. Bell, A. J. Borkin, J. H. Brenner, Mary E. Casper, Beryl G. Castell, J. B. Cowie, J. C. Davis, E. Dewsbury, W. M. Edwards, W. Ellenbogen, Jeanne A. Elphick, H. C. Endbinder, D. W. A. Evans, A. J. Farmer, Sheila K. Frazer, T. H. H. Green, G. I. T. Griffiths, M. F. Holt, Elizabeth Howorth, A. B. Jones, E. Jones, S. Kalinsky, E. Keiden, F. D. Kitchin, F. P. Lennon, G. H. Lucas, Cicely D. Lyons, Edith G. Mercer, J. Moloney, Janet H. Mountford, J. M. Old, W. L. Owen, Dorothy C. Peterson, J. S. Porterfield, J. E. Riding, L. Robinson, D. L. Sharples, Audrey A. Shone, G. C. Slee, W. B. Smellie, R. J. Smith, Basha Taylor, Dorothy [illegible] Thompson, R. Towers, M. H. Turner, [illegible] ara M. Webber, H. H. W[illegible]

[illegible] gy).—Audrey M. [illegible] nns, R. Brearley, [illegible] I. E. Carmichael, Helen A. [illegible] Croft, Pauline M. Dean, R. [illegible] Ailsa M. Heath, G. C. Hu[illegible] M. Killick, T. S. Law, Jean Learoyd, A. C. Levinson, H. S. Levy, T. R. Littler, J. A. O'Garra, A. E. Pritchard, Rachel M. Rawcliffe, G. P. Reed, H. Roberts, W. G. Roberts, P. W. Robertson, Olive R. Rodgers, K. S. Shaw, F. W. Sheffield, H. H. Slack, Helen M. Taylor, L. Tomkin, Dorothy E. M. Thomas, R. G. Thomas, Maureen M. Tickle, L. F. Tinckler, D. R. Wallace-Jones, J. Ward, Joyce Watson, N. P. Watson, W. F. Wille, E. H. Wilson, Esmé M. Wien, Aline N. Wynroe.

Passed in public health.—M. H. Clark, S. Croft, P. Hampson, R. W. Kennon, T. S. Law, Rachel M. Rawcliffe.

University of Birmingham

Dr. Thomas McKeown has been appointed to the chair of social medicine.

Dr. McKeown, who is 32, was bo[illegible] and has lived in Canada for most of his li[illegible] ith first-class honours in chemistry at the [illegible] mbia in 1932. He then went to McGill University, where he worked on endocrinology under Prof. J. B. Co[illegible] ee. Gaining a Rhodes scholarshi[illegible], in 1935 and continued his work [illegible] of human anatomy. After graduating as D Phil he turned his attention to medicine and qualified as MB Lond. in 1941. Since then, except for time spent in a house-appointment, he has worked in the research and experiments department of the Ministry of Home Security, being head of a team of 15–30 officers concerned with study of air-raid casualties and with the social and economic assessments of raids; it is the experience derived from these raids which made him decide to devote himself to social medicine. He has published jointly a number of papers on endocrinology, and is particularly interested in the study of human fertility.

Dr. McKeown will not be able to start work in Birmingham until after demobilisation. At present he is abroad on a special investigation for the Ministry of Home Security.

Royal Society of Medicine

On Tuesday, April 10, at 5 PM, at the section of psychiatry, Major W. L. Neustatter will read a paper on 750 psychoneurotics and ten weeks' fly-bombing. The section of physical medicine is to meet on April 14, at 2 PM, at the Clarendon Laboratories, Oxford.

Medical Society of the LCC Service

At a meeting to be held on Wednesday, April 11, at 2.45 PM, at *the Fountain Hospital, Tooting Grove, SW17, Dr. L. T.* Hilliard will give a clinical demonstration on mental deficiency in children.

Hospital Treatment of Service Casualties

The Middlesex County Council public health committee is asking the Minister of Health to make representations to Service departments about the keeping of Service casualties or sick in hospital after the stage at which they would be discharged if they were civilians. The committee states that hospitals are often called upon to admit men who are in no need of hospital treatment, but are merely waiting to go before a medical board. At a time when demands on hospital accommodation are so heavy it is considered undesirable to have men in hospital who might be dealt with at home or as outpatients.

UNRRA

The Balkan mission is leaving Cairo, where it is succeeded by a smaller organisation called UNRRA, Middle East Office. A special mission headed by Dr. Ernest L. Stebbins, commissioner of health for New York, is to visit Italy to study the needs of mothers and children suffering from malnutrition and related diseases. It will work with the UNRRA health mission already in Italy.

More than 2 million pounds of used clothing have either been shipped or are scheduled for early shipment from the United States to liberated western Europe.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

Venereal Disease in United States Army

Lieutenant-Colonel Thomas H. Sternberg, of the Office of the Surgeon-General, Washington, recently stated that th US Army venereal-disease rate for the continental Unite States rose from 26·3 per 1000 men in 1943 to 40 per 1000 1944. This increase, he said, was due to gonorrhœa and mu reflect, at least partially, an increase in the incidence civilian gonorrhœa. The syphilis rate had declined 20 p cent. last year. The intensity of the campaign against V in the USA had been lowered by the overseas assignment most of the Army's trained VD control officers. The com bined rate for all American soldiers overseas was now low than for those stationed in the States. American soldie with VD are not returned to civilian life until they have ha enough treatment to prevent their transmitting infection.

Appointments

BROWN, PAT, MRCS: medical superintendent, County Coun Hospital, Hereford.

FRAME, T. C., MB GLASG.: examining factory surgeon for Muirki Ayrshire.

LE VAY, DAVID, MS LOND., FRCS: surgical registrar, Royal Natio Orthopædic Hospital, London.

MACDONALD, JOHN, MB GLASG.: examining factory surgeon Dudley, Worcs.

MAINGOT, RODNEY, FRCS: surgeon to the Royal Free Hospi London.

PARK, G. D., MB, DPH: assist. MO for Devon.

PROCTOR-SIMS, NORA, MRCS, MRCOG: asst. MO for Devon.

Births, Marriages, and Deaths

BIRTHS

BARBOR.—On March 25, at Hoddesdon, Herts, the wife of Ronald Barbor—a son.

ELLIS.—On March 21, at Cromer, the wife of Dr. M. G. Ellis— daughter.

LEE-WOOLF.—On March 21, at Banbury, the wife of Dr. Bas Lee-Woolf—a son.

MURRAY-BROWNE.—On March 24, the wife of Dr. W. G. Murray Browne—twin son and daughter.

PRIDIE.—On March 23, at Clifton, to Dr. Joanna Pridie (née Ege ton), wife of Mr. Kenneth Pridie, FRCS—a son.

PROSSER.—On March 23, at Harrogate, the wife of Dr. Les Prosser—a daughter.

STRETTON.—On March 19, in London, the wife of Dr. John Strett —a daughter.

WINTER.—On March 22, in London, the wife of Lieutenant J. Winter, RAMC—a son.

MARRIAGES

ALEXANDER—BROWN.—On March 8, in Glasgow, James Alexand surgeon lieutenant RNVR, to Rosamond Elizabeth Brown.

MOFFATT—WHYTE.—On March 1, at Delhi, George Mayne Moffat colonel IMS, to Susan Joan Whyte.

PEEBLES—MACILW[illegible] Ian C. Peebles, [illegible]

THOMAS—MAYO.—[illegible] Thomas, surge[illegible]

WHITWORTH—JON[illegible] Whitworth, ca[illegible]

DEATHS

BARON.—On March 25, at Orford, Horatio Nelson Baron, MRCS

INGRAM.—On March 21, at Newport, Mon., Percy Cecil Park Ingram, MB LOND., DL, aged 69.

LING.—On March 25, Harold Charles Ling, MRCS, of Keighle Yorks.

MACKLIN.—On March 27, Christopher Hugh Macklin, MRCS, Ampthill, near Bedford.

MASON.—On March 23, at Angmering-on-Sea, Sussex, Philip Jam Mason, MB BIRM.

QUENNELL.—On March 26, at Brentwood, Essex, Arthur Quenne MRCS.

SHEEN.—On March 28, at Cardiff, Alfred William Sheen, CBE, MS LOND., FRCS, colonel AMS, provost Welsh National School Medicine, aged 75.

SHEWELL.—On March 27, at Minterne, Dorset, Herbert We Bayly Shewell, OBE, MB CAMB., RN, retd., aged 72.

STOKES.—On March 26, at Hastings, Francis Alexander Sto MRCS, aged 84.

THOMPSON.—On March 23, at Bridgwater, Wilberforce Thomp MRCS, LSA, DPH, aged 82.

"... It is rather deplorable that there should have gro up what seems almost an emulation in misery between British and American public when the important thing is th we are so much better fed than our Continental allies. B the British and American peoples have a very opulent d compared with them. There is no question that there is m food in the United States than here, and on the whole th American public eats better than the British public, but no much better as some stories would indicate. We have ple to eat, but it is very often not what we want to eat."— Elmer Davis, director of the United States Office of W Information, speaking in London on March 27 (*Times*, March

CHRONIC AMŒBIASIS

INVESTIGATION AND TREATMENT

W. L. LAMB
M B EDIN., F R C P E
LIEUT.-COLONEL RAMC; OFFICER I/C A MEDICAL DIVISION

G. R. ROYSTON
M D LOND.
MAJOR RAMC; MEDICAL SPECIALIST

From a Military Hospital in England

FEW physicians in this country have so far had the opportunity of dealing with amœbiasis, so the importance of early recognition and thorough treatment may not be generally realised. But for some years to come many men who have served in the tropics will be arriving home, and some of these will have had the disease and already been treated for it on one or more occasions, while others may have had symptoms so mild as to escape detection. In most cases amœbic dysentery, in contrast to the bacillary form, has a comparatively mild and gradual onset and course with few constitutional signs, no rise of temperature, and only slight diarrhœa. This absence of acute signs may mislead both patient and doctor, for amœbiasis is essentially a chronic process which may, if not recognised early and treated adequately, lead to invalidism and chronic ill health, and sometimes disaster. It is usually only a danger to life when an amœbic liver abscess is unrecognised and untreated, and this has constantly to be borne in mind. Unfortunately it is often forgotten and a patient diagnosed as having pneumonia when a few injections of emetine would produce a dramatic change.

Ipecacuanha root has long been known to benefit cases of dysentery and was first used by Piso in 1658.
It was sold to t
and Helvetius
Two centuries
cians used it
work 60 grains.
Leon injections
of en alkaloids,
in small doses of gr. ⅓–⅙ to three cases. The results were spectacular and great hopes were held out for the future. This was, and still is, undoubtedly the greatest single advance in the treatment of this troublesome disease and its dangerous complication, hepatitis, but since then many other drugs and combinations of drugs have been introduced, some containing emetine and others of a totally different nature. These may be divided up into four groups, the best known being as follows:

I. *Emetine*

II. *Organic arsenicals*

Acetarsol } (by mouth)
'Stovarsol' } (by mouth)
Carbarsone (by mouth)
'Amibiarson' (by mouth)

III. *Iodine compounds*

Chiniofon } (by mouth or rectum)
'Yatren' } (by mouth or rectum)
'Quinoxyl' } (by mouth or rectum)
'Vioform' (by mouth)

IV. *Miscellaneous*

Bismuth (by mouth)
Kurchi (by mouth)
Eusol (per rectum)
Silver nitrate (per rectum)

Each of these drugs, or more usually a combination of two or more, has its advocates. Thus Manson-Bahr (1939) has for some time suggested the "combined treatment" with emetine bismuth iodide (EBI) by mouth and chiniofon enemas, and he claimed that of 100 patients so treated in all but 2 it had given satisfactory results. In his opinion this is "the most efficacious treatment of intestinal amœbiasis which has yet been devised." In his Lumleian lectures (1941) he describes a critical study of 535 cases. Of these, 323 were treated with EBI and chiniofon enemas for 10 days and the relapse-rate was 3·7%, while 114 cases received EBI alone for 10 days and 6·1% relapsed. Other forms of treatment, such as emetine periodide for 10 days (46% relapse), auremetine for 10 days (100% relapse), chiniofon by mouth and rectum (22·8% relapse), stovarsol for 10 days (87·5% relapse), and carbarsone (100% relapse), gave very indifferent results.

On the other hand, Mateer and others (1940) maintain that carbarsone is the "most effective amœbicidal drug now known" and that when used alone as single drug therapy and in a single course of treatment it failed in 10% of cases, but when combined with chiniofon retention enemas it cured 101 out of 104 cases (97%). Included in this series were 19 cases of chronic relapsing dysentery. The 3 failures were later cured with vioform. Brown (1935) claimed 94·7% of cures out of 142 cases using combined emetine injections and arsenicals, while Anderson and Reid (1934), and Reid and others (1932) reported 89% and 90% cures with carbarsone alone.

In contrast to these excellent results, Craig (1934) has noted not more than 15% of permanent cures with emetine alone, and Chopra and Chopra (1942) say that emetine therapy usually fails in chronic intestinal amœbiasis and the carrier condition, though it is by far the most satisfactory immediate line of treatment in acute amœbic dysentery. In their hands, EBI has not been very successful unless given in repeated courses, and quinoline derivatives "do not appear to hasten cure," but the organic arsenicals, especially if given with a small dose of salts in the morning, have been effective. They have found that kurchi alkaloids are effective in both acute and chronic forms of the disease and have given very satisfactory results.

Ruffin (1943) has followed patients who continue to
relaps vitamin-B
compl anced diet
supple thiamine,
and riboflavine. His cases were treated with carbarsone gr. 4 twice a day and chiniofon retention enemas for 10 days, but there were frequent relapses necessitating a repetition of the course.

Willmore and Martindale (1926), using combined treat-
ment 'Emetol' and bismuth
in 40 amœbiasis, say that 37
(92·5% from any evidence of
infection for a minimum period of six months after completion of treatment. They claim that this method of treatment gave more hopeful immediate results than any other tried, though they admit that it is impossible

mbined treatment
varsol stood first
nce the least toxic
with regard to the
eradication of amœbæ.

From a study of the published reports, therefore, the chances of effecting a "cure" in all cases of amœbic dysentery appear to be good, though there is divergence of opinion as to the best method.

PRESENT SERIES

Du
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of whom had been invalided from overseas for amœbiasis. The majority had come from India, and, except for 3 cases, all had had previous treatment for a varying number of relapses. We have carried out the routine examinations which will shortly be discussed and have divided the cases into three groups—(1) those who have had amœbic dysentery and been treated for it elsewhere but in whom we have failed to discover any signs of activity (14 cases); (2) those similar to the above but in whom evidence of active ulceration has been found by us (34 cases); and (3) a small group with ulceration and positive stools who gave no previous history of investigation or treatment though they had had slight symptoms (3 cases). We have called those in group 3 fresh cases. This paper deals with groups 2 and 3.

INVESTIGATION

The following procedure has been adopted for the investigation of all cases with a history suggestive of past or present dysentery.

All patients were weighed weekly.

On admission, a fresh stool was sent to the laboratory for microscopical examination and culture. If the stool was formed and both microscopically and macroscopically normal, a dose of magnesium sulphate was given on three consecutive mornings and the resulting daily fluid stool examined in the laboratory.

Sigmoidoscopy was then performed on all cases irrespective of the stool findings. A scraping was taken with a long-handled spoon from any ulcers or suspicious looking areas. The contents of the spoon were taken on to a throat swab, immersed in a few c.cm. of warm saline in a test-tube and sent immediately to the laboratory. In this way it was found possible in 94% of cases with ulceration to demonstrate active vegetative forms of *Entamœba histolytica*. On only three occasions were these organisms found in the stools and not also recovered directly from the bowel. In 4 cases *E. histolytica* were obtained sigmoidoscopically but the stools remained persistently negative. On two further occasions with positive stools typical amœbic ulcers were seen but yielded no *E. histolytica* on scraping.

Cases suggesting hepatitis had, in addition to the above, a white-cell count and the chest screened for diaphragmatic abnormality. Particular emphasis was placed on any pain in the region of the liver, bulging of the right chest wall, pain on compression of the chest, and increased liver-dullness with or without a palpable tender liver border. One case of undoubted amœbic hepatitis that responded dramatically to emetine hydrochloride had no leucocytosis, though in our experience leucocytosis is the rule in this condition in contradistinction to the frequent leucopenia of epidemic infective hepatitis.

Cases of amœbic ulceration then received the course of treatment to be outlined later. At the end of treatment, after an interval of 2–3 days to allow the bowel to recover from the effects of the retention enemas, a sigmoidoscopy was performed, followed by laboratory examination of a further group of three stools after saline purges.

If no abnormality was detected the patient was then sent away for 2 weeks' convalescence on an ordinary diet to a Red Cross home with instructions to return for a final sigmoidoscopy and stool examination. If, on return, the sigmoidoscopic appearances were satisfactory and the stools negative, it was hoped that a cure had been obtained and the patient was sent back to the convalescent home for a further 2 weeks and subsequently to a convalescent depôt for rehabilitation. His duties were then restricted for 3 months to light work in this country, at the end of which period his case would come up for review.

TREATMENT

A 21-day course of treatment based on that recommended by the School of Tropical Medicine, Liverpool, was given, aimed at attacking the *E. histolytica* in both its cystic and vegetative forms via the blood-stream as well as locally in the lumen of the bowel. This latter means of attack is of considerable importance, since many of the more chronic amœbic ulcers have a poor blood-supply. Emetine was given by mouth in the form of auremetine (Martindale) gr. 1 t.d.s. in capsules, on the odd numbered days of the course. Stovarsol or carbarsone gr. 4 t.d.s., was given on the even numbered days, with, in the evening, a retention enema of 8–15 oz. of freshly prepared 2½% quinoxyl changing to 4% half-way through the course. In addition to the above, bismuth subnitrate gr. 60 t.d.s. in milk was given every day. The retention enema was preceded by a rectal wash-out with a weak sodium bicarbonate solution to remove mucus, and was run in with the patient lying on his left side with the foot of the bed raised. After 10 minutes he turned on his back and 10 minutes later the blocks were changed from the foot to the head of the bed and the patient turned on his right side. After 10 minutes in this position the blocks were removed and the patient allowed to sleep in a position of his own choosing. By this means it was hoped that at any rate some of the quinoxyl would reach the cæcum. It was found that most patients retained their enemas until they woke next morning. In only one case was it thought advisable, on account of nocturnal diarrhœa, to give the quinoxyl in the morning. The patients were confined to bed on the auremetine days, but, if fit, allowed up in the vicinity of the ward on the stovarsol or carbarsone days.

Most cases complained of nausea on the auremetine days but did not actually vomit. No other toxic effects were noted.

Diet.—A full light diet was given, without meat or green vegetables, with strained soup and potato mashed or as a purée. This was supplemented by yeast ½ oz., a[illegible] acid 50 mg., extract of malt with vitaminised [illegible] b.d., and 'Marmite' daily. Cases showing evidence of vitamin-B deficiency received in addition nicotinic acid mg. 100 q.d.s. by mouth; in one case sodium nicotinate intravenously and in a second case aneurine intravenously were also given.

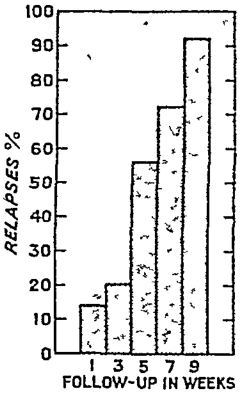
RESULTS

Twenty-nine cases of proved amœbic dysentery have received the auremetine course of treatment described above. Twenty-six of these were chronic relapsing cases and the remaining 3 were fresh cases that had received no previous treatment.

The chronic relapsing cases had histories of from 5 months to 5 years, with an average of 12 months, and had received courses of emetine hydrochloride by injection ranging from gr. 10 to gr. 109 (case 1). Twelve cases had had more than gr. 50, and the average for all cases was gr. 45. This was without taking into account emetine in the form of EBI and EPI. The majority had also received repeated courses of arsenicals in the form of stovarsol, carbarsone, or amibiarson, and retention enemas of chiniofon.

It was difficult to ascertain accurately the number of relapses for individual cases, since often what appeared to be a relapse was really a continuation of a previous recrudescence. Some of the cases had remained symptom-free for periods ranging from 6 months to a year: a few had probably remained consistently positive in spite of repeated courses of treatment.

Cases 1–7 inclusive were treated before auremetine became available. They received stovarsol gr. 4 t.d.s. and quinoxyl retention enemas nightly for 21 days. At the end of treatment 5 were clinically cured, but case 1 still had *E. histolytica* in his stools and case 2 continued to pass cysts. The 5 apparent successes all relapsed within a month; they then received the auremetine course, and 4 relapsed again in 21–58 days; 3 cases received a second course of auremetine, and these all relapsed again within a month.



Relapse-rate after different periods of follow-up.

Of 17 cases which received a single course of auremetine, 2 remained positive throughout treatment and showed no clinical improvement, 1 relapsed after 5 weeks, and of the remaining 14 cases 9 were found satisfactory in 24–88 days and 5 in 5–9 days. These results are misleading, for, as the figure shows, the relapse-rate was almost directly proportional to the time of observation during convalescence; whereas after 5 weeks 56% had relapsed this rate had risen to 91% after 9 weeks. It therefore seems reasonable to suppose that the 14 apparently successful cases will relapse within 9 weeks. This serves to emphasise the disparity between results obtained before and after adequate follow up.

The 3 fresh cases treated have *not* been followed up long enough to give any idea of the prognosis. The most that can be said is, so far so good, and that when last examined 9, 31, and 71 days after the end of treatment they were free from infection.

DISCUSSION

No-one reading the writings on this subject can help noting, as we did, the high percentage of cures claimed by many physicians using different drugs, especially in combination, but it is difficult to decide from most of the reports what types of case were being treated and what were the standards of cure. Our own experience during this war in hospitals both in the Middle East and at home is that the early case which has had no previous treatment presents a very different problem to the chronic type of case with which this paper deals. While in the Middle East we saw a number of fresh cases and treated them with apparent success on the lines advised by the Medical Directorate, GHQ, MEF—that is, a daily injection of emetine hydrochloride gr. 1 for 12 days, then 2–3 weeks' rest at a convalescent depôt, during which stovarsol or carbarsone gr. 4, twice a day, was taken, followed by readmission to hospital for a combined 12-day course of EBI gr. 3, and 2½% quinoxyl retention enemas daily. We were, unfortunately, unable to follow up these cases for any length of time, but during 2 years in this theatre of war and in different hospitals neither of us saw any relapse cases following this standard treatment either from our own or other hospitals. It is a noticeable feature of the present series that very few were initially treated so thoroughly. In most instances after a course of 12 emetine injections the men were returned to duty only to relapse after varying intervals. We therefore conclude that in order to prevent as many cases as possible from reaching the chronic state, in which most of our present series of patients now find themselves, the utmost care and thoroughness is called for during the initial course of treatment.

The present series is a small one and none of the patients has been under observation by us for more than 5 months, yet, during this short time, of those cases that have been followed up for 9 weeks, 91% have been shown to relapse. We began treating these men with hopes of "curing" at least 50 [illegible] even reasonable success, an [illegible] the drugs used by us has [illegible] once it has been firmly established in the gut. It seems probable that the amœbæ have become "resistant" or "emetine-fast" as a result of repeated courses. We believe that there is no drug at present in use which can be expected to give even a moderate hope of cure in this type of case, and that some new therapeutic agent is urgently called for to rescue these men from chronic invalidism.

During the period these patients have been under observation it has been possible to adopt a very strict supervision and rigid standard of cure. Willmore and Martindale (1926) cla [illegible] "responded to treatment for at [illegible] than being cured. This seems [illegible] to adopt; for many patients [illegible] for weeks, months, or even years without it being possible to say they are cured. We are not here concerned with "healthy cyst passers," as all our cases have been active, though occasionally only cysts of *E. histolytica* have been found in the stools, which have in all cases contained blood and/or mucus during the early stages of the investigation.

In assessing response to treatment or tests of cure there are several points which require stressing.

(1) *The patients' subjective sensations.*—These may at times be difficult to weigh up accurately, since many of these men, as a result of long hospitalisation and repeated courses of treatment, become "bowel conscious" and develop anxiety symptoms. On the other hand, the better type of man may say he is "feeling fine" quite shortly before a relapse.

[illegible] ver the right and/or [illegible] um or sigmoid, and [illegible] is a valuable guide to the presence or absence of activity, but not infallible.

(3) *Stools.*—The number during 24 hours is of less importance than their character. In all active cases the stools will contain mucus with or without blood, and it is in the mucus that active *E. histolytica* are found. At least three consecutive stools, preferably fluid ones after salts, should be examined on each occasion, for we have often found the second or third specimens positive after the first was negative. The stool must be examined when still warm—i.e., within 5 minutes—and there must be no trace of antiseptic in the bedpan.

(4) *Sigmoidoscopy.*—This is an essential part of each examination and should be done by the physician who is looking after the patient. Scrapings from any ulcers, and, if these are not seen, any mucus, should be examined with the minimum of delay.

It has already been noted that sigmoidoscopic findings may be positive when stools are negative and vice versa. Each test of cure therefore should consist of examination of the patient, three or more stools, and sigmoidoscopy. We believe that if this routine had been carried out in all cases regularly every few months many of the more optimistic results recorded would have had to be modified.

SUMMARY

A series of 81 patients recently returned from overseas has been investigated for amœbic dysentery and those with positive findings treated by mouth with auremetine, carbarsone, or stovarsol, and bismuth subnitrate, and with quinoxyl enemas.

Three fresh and 26 chronic relapsing cases have been treated and the results analysed, the relapse-rate in the chronic cases 9 weeks after treatment being 91%.

Thorough treatment of fresh cases is essential if the number ending in chronic ill health is to be reduced.

A new therapeutic agent for the treatment of chronic relapsing amœbiasis is needed.

We are indebted to Major N. G. B. McLetchie, RAMC, pathologist, for personally examining all specimens of stools and scrapings in the laboratory and for his criticism; to the nursing staff, Sister E. Stamp, QAIMNS(R), in particular, for their cooperation; and to Colonel H. F. Panton, commanding the hospital, for his help in obtaining a suitable diet. This work would not have been possible without the help of Brigadier R. Priest, command consulting physician, who at the request of the War Office instituted this investigation.

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EFFECTS OF *CL. WELCHII* TYPE A TOXIN
ON BODY TISSUES AND FLUIDS

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THE effects of any bacterial toxin on the body are essentially two-fold—direct and indirect. The toxin may have a direct action on local or distant tissues, or, as a result of this action, substances may be liberated which produce pathological changes elsewhere. The toxins produced by the main pathogenic clostridia contain enzymes, two of which are hyaluronidase[12 13] and lecithinase.[15] The object of this paper is to put forward some observations on the effect of these ferments on body tissues and fluids, with special reference to the effect of lecithinase on the structural lipids.

MATERIALS

Animals.—Guineapigs of 500 g. average weight.

Toxin.—Standard *Cl. welchii* toxin Pf 9c in 50% glycerol (lecithinase: 200 Lv units per ml.; hyaluronidase: 12,000 VRU and 80,000 MCP units per ml.).

Antitoxin.—Refined gas-gangrene antitoxin polyvalent globulins (1800 perfringens, 900 septicum, and 1800 œdematiens units per ml.) (*BWCo.*) ed.

Alipæmic sera were obtained from normal human subj peri- after a starvation period of 12 hr. anical

Chylomicrons.—These are the fat particles which paper. in the blood at the height of fat absorption. This typ ation lipæmic serum was obtained from normal human subj om- 2½ hr. after the ingestion of a fatty meal. ut

Red cell suspension.—5% of washed human red cells in normal saline.

METHODS

1. *In-vitro experiments.*—The tissue or fluid substrate was incubated with toxin at 37° C. In each case saline and toxin-antitoxin controls were used as the basis for comparison at the end of the experimental period.

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* Sir Halley Stewart research fellow.

TABLE I—EFFECT OF *Cl. welchii* TOXIN ON TISSUES IN VITRO

Material	Gross appearance	Histology	Chemistry
Connective tissue: In toxin	Softening and fragmentation	Pyknosis and disappearance of fibrocyte nuclei. Separation and fragmentation of collagen fibres.	..
In toxin-antitoxin mixture	No change	Normal appearance	..
Striated muscle: In toxin	Gross fragmentation with gas formation. Thin layer of free fat separates	Fragmentation. Disappearance of endomysial connective tissue and sarcolemmal nuclei. Vacuolation of sarcous substance	Mg. of lipoid P per g. ether-soluble matter: 2·15
In toxin-antitoxin *mixture*	*No* change	*Normal* appearance	5·3
Adipose tissue: In toxin	Apparently little change, but on shaking the tube there was immediate disintegration of the tissue with massive liberation of free fat globules	Rupture of cell membranes. Lysis of nuclei and disappearance of fat	Fatty acid 4·5%. Acetyl value 4·5
In toxin-antitoxin mixture	No change. Stable on shaking. No free fat	Normal appearance	*Fatty acid* 1·4%. Acetyl value nil
Sciatic nerve: In toxin	Attenuated and fragile	Distortion of myelin sheath; swelling of axis cylinder	..
In toxin-antitoxin mixture	No change	Normal appearance	..

In the toxin-antitoxin mixtures an excess of antitoxin was added and the mixture was allowed to stand for 15 min. before being added to the substrate.

2. *Animal experiments.*—Histological and biochemical studies were made of the effects of intramuscular and intraperitoneal injection of lethal doses of toxin into guineapigs. Dilutions were made up in 1% procaine to obviate pain.

3. *Clinical studies.*—Material was examined from patients with clostridial infections. The main findings only are indicated in this paper, as a more detailed account of the clinical cases will be published separately.

4. *Histological technique.*—Hæmatoxylin and eosin were the routine stains for paraffin sections, but, in addition, Heidenhain's iron hæmatoxylin, Mallory's phosphotungstic acid hæmatoxylin, and Masson's trichromic methods were used. Fat was detected in frozen sections by staining with Sudan IV. The preparations of nervous tissues were examined by the methods of Marchi, Alzheimer, and Kulschitsky-Pal. As an additional test, frozen sections mounted in glycerol were examined under crossed Nicol's prisms.

5. *Chemical analysis.*—Lipid material was extracted from the *tissues by standard methods. The lipoid phosphorus* was estimated by the method of Briggs,[4] the fatty acid was determined by titration with alcoholic NaOH, and the acetyl value by the method of West, Hoagland, and Curtis.[22]

6. *Chylomicron flocculation test.—Procedure:* Equal quantities (0·1 ml.) of the patient's serum and freshly obtained lipæmic serum were mixed in a small agglutination tube under aseptic conditions and incubated at 37° C for 14 hr. Controls of each serum in saline were put through simultaneously. The specimens were read by hand lens at the end of the experimental period, and samples from each tube were examined under dark-ground illumination, using a cardioid condenser, 1/12 o.i. apochromatic objective and × 20 eyepiece.

Interpretation.—Negative: chylomicrons normally dispersed and in active Brownian movement; macroscopically the appearance of the mixture remained unchanged. *Positive:* macroscopically large aggregates of particles can be seen adhering to the side of the tube and the fluid has become clear; under dark-ground large still clumps of particles are seen with no free-moving chylomicrons. *Incomplete positive:* The macroscopic appearance is similar to the positive repaction but not so well marked: under dark-ground, clumps By a be seen but there are a number of free moving particles quincell.

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Results

DIRECT LOCAL EFFECTS

th Four *primary tissues—connective tissue. striated* muscle (freed from all obvious fat), adipose tissue, and peripheral nerves—were studied.

(1) *In vitro.*—The effects of the direct application of the toxin to these tissues are shown in table I. In each experiment sufficient (3 ml.) toxin solution (30 Lv. units per ml.) was added under aseptic conditions to cover the tissue, and the mixture was incubated at 37° C for 14 hr. The main observations reported have been constant fin [illegible] at least five successive experiments.

(2) *Experimental.*—51 guineapigs were used for these experiments. Most of these animals were injected intramuscularly; the average dose used was 100 Lv. units per kg. body-weight. The morbid histology of clostridial infections has been extensively described,[1 18] and our observations are essentially in agreement with these findings. Some special points require comment:

(*a*) *Connective tissue.*[11]—This was involved early and its destruction often preceded that of muscle. The fibrocytes showed pyknosis of their nuclei and later disappeared. Separation of the collagen fibres was pronounced, and in many cases fragmentation occurred. Dense connective tissue, in which the fibres were more resilient, also showed early disappearance of cells.

(*b*) *Muscle.*—The changes here were similar to those described by many authors,[1 18] but endomysial connective tissue appeared to be affected before the muscle-fibres. In the latter, the sarcolemmal nuclei were the first to show any change; the sarcous substance was only involved later.

Chemical analysis of muscle debris removed 6 hr. after inoculation showed complete disappearance of lipoid phosphorus, while normal controls gave a figure of 7·5 mg. of lipoid phosphorus per g. of ether-soluble material (average of 6 experiments).

(*c*) *Adipose tissue.*—When the toxin was injected into the thigh muscles, the normal gluteal and popliteal fat depôts (as compared with the normal side) disappeared within 6 hr. Large globules of free fat were always seen on the œdema fluid around the site of injection. Microscopically the cell membranes of the individual fat cells were ruptured and the nuclear material was lysed. Typical fat necrosis was seen in some cases.

(*d*) *Tendon and nerve*: These tissues appeared to be more resistant to destruction and were found running through the necrotic mass 6 hr. after injection. They were, however, destroyed by longer exposure to the action of the toxin.

(*e*) *Blood-vessels*: Vasodilatation and thrombosis were regularly seen, especially at the site of injection and in *the regional lymph-nodes. It was also encountered in* distant organs, such as the lung and spleen, particularly after intraperitoneal injection. Swelling of the vascular endothelium, which has been previously described,[1] was also observed.

(3) *Clinical.*—The main features described above were demonstrated in material obtained from human cases.

DIRECT DISTANT EFFECTS

On plasma and formed elements of blood.

The effect of *Cl. welchii* toxin on the red cell envelope, the chylomicron surface, and soluble plasma lipoprotein complexes [2 16] has been studied both in vitro and in vivo.

(1) *In vitro.*—The results of the in-vitro studies are shown in table II.

TABLE II—EFFECT OF *Cl. welchii* TOXIN ON PLASMA AND FORMED ELEMENTS IN BLOOD

Substrate	Effect of toxin	Effect of toxin-antitoxin mixture
Washed red cells		
(*a*) Human	Hæmolysis down to conc. 0·1 Lv per ml.	Nil
(*b*) Guineapig	Hæmolysis down to conc. 0·1 Lv per ml	Nil
Lipæmic serum		
(*a*) Human	[illegible]	Nil
(*b*) Guineapig	[illegible]	Nil
Alipæmic serum		
(*a*) Human	Turbidity develops due to breaking of lipoprotein complexes (Nagler reaction)	Nil
(*b*) Guineapig	Nil	Nil

The products of hæmolysis did not cause any further breakdown of red cells after neutralisation with antitoxin.

(2) *Experimental.*—In the experimental studies on guineapigs there was no gross hæmolysis up to 16 hr. after injection. Guineapigs do not readily absorb fat from the intestine and consequently do not normally show an increase of fat particles in the blood during absorption. Such fat particles as may occur, which may have a different structure from the chylomicron, do not flocculate with lecithinase. It was also found, in confirmation of Nagler's observation[19] that lecithinase did not cause any breakdown of lipoprotein complexes in the plasma of guineapigs. The serum from injected guineapigs had no demonstrable effect on human blood substrates in vitro.

(3) *Clinical.*—The possible application of the effect of lecithinase on chylomicrons in vitro as an indicator of circulating toxin in the blood was investigated in a series of clinical cases.

Of 148 sera from patients with infected war wounds examined with the chylomicron flocculation test, 36 gave a strong positive reaction, 29 an incomplete positive reaction, and the remainder were negative; 33 normal donors of various blood-groups were examined and their sera were all found to be negative. The positive reaction obtained correlated well with the [illegible] ction, and the positive [illegible] ith one exception, as [illegible] It was found that the positive flocculation reaction was not specific for [illegible] monstrated in other [illegible] vitro action of leci- [illegible] was no concomitant breaking of lipoprotein complexes. It was also found that the chylomicron flocculation reaction was not regularly preventable with antitoxin, nor was it related to the antitoxin level in the patient's serum.

In certain cases hæmolysis seems to be a feature, but it is difficult to determine whether this is a direct or indirect effect of the clostridial toxins, or whether it is due to some other cause. We have insufficient evidence to decide whether the lipoprotein complexes in human serum are broken down in clostridial infections.

On other organs.

High concentrations of *Cl. welchii* toxin will cause extensive *hæmorrhagic lesions in most organs.* This can be demonstrated in experimental studies when large doses are injected intraperitoneally. With smaller doses effects are seen in the central nervous system, which contains a high proportion of suitable lipid substrate. The effects of *Cl. welchii* toxin on nervous tissue has been studied.

(1) *In vitro.*—On incubation of guineapig brain slices with *Cl. welchii* toxin, there was an increase in doubly refractile material within 1½ hr. This was followed by a rapid decrease of this material and its complete disappearance within 16 hr. The lipid phosphorus was reduced to 1·05 mg. of lipoid phosphorus per g. of ether-soluble material from 7·55 mg. found in the toxin-antitoxin control.

(2) *Experimental.*—Early demyelination was demonstrated by Marchi's method in the brain and spinal cord of some animals dead within 16 hr. of *Cl. welchii* toxin injection. In an animal allowed to survive for 3 days *with repeated small doses of toxin the changes* were more pronounced.

(3) *Clinical.*—Extensive demyelination associated with functional changes occurred in two fatal cases of clostridial infection.

INDIRECT EFFECTS OF TOXIN

The main effect, which was indirectly attributable to the action of *Cl. welchii* toxin, was fat-embolism. The embolism was mainly pulmonary, but other organs may also be involved.

(1) *In vitro.*—Large globules of fat were liberated from muscle or adipose tissue as described above.

(2) *Experimental.*—The intramuscular or intraperitoneal injections of *Cl. welchii* toxin in guineapigs regularly resulted in pulmonary fat-embolism which was [illegible] mainly [illegible] llaries [illegible] and [illegible] r of experiments in rabbits fat-embolism was also demonstrable, and the characteristic *symptoms associated with* fat-embolism[8] and the typical post-mortem findings of this condition were demonstrable.

(3) *Clinical.*—In a number of cases of clostridial infection symptoms and signs were recorded which might be attributable to pulmonary fat-embolism. At the autopsy on two fatal cases fat-embolism was demonstrable histologically.

Discussion

Many problems with regard to clostridial infections in man remain unsolved, particularly the full understanding of the mechanism of spread and the factors which determine the change from a mild to a severe infection. A further group of problems is concerned with the pathology of the systemic reactions to clostridial infections. The experiments described above indicate some points which may be significant in determining the local spread of infection, and they also open up two new [illegible] d *to the systemic re-* [illegible] and fat-embolism. [illegible] he toxin on connective [illegible] ll tend to spread along [illegible] clinical phenomenon. [illegible] uscle [illegible] and the development of a [illegible] eems probable that the essential requirements for the development of a severe clostridial toxæmia are the provision of a good environment for the growth of the organism and a supply of suitable food material for the production of potent enzymes. Phospholipid may play an important part in oxygen carriage,[3 20] especially in active tissues such as muscles. An anaerobic environment is essential for clostridial growth, and it is suggested that the rapid removal of phospholipid from muscle by lecithinase will help to produce favourable conditions for [illegible] ce [illegible] some clinical cases, but to what extent this is due to any [illegible] caused by the [illegible] been decided. [illegible] in our experi*mental studies,* and its assessment from the clinical point of view is discussed more fully in another paper. The other changes in the blood consist of flocculation of chylomicrons and the breaking of lipoprotein complexes. These changes do not occur in guineapigs, but they may have some significance in the human subject. The effect on chylomicrons is not surprising since it can be shown that phospholipid plays a part in the maintenance of stability of this type of fat particle.[3] The flocculation test described above appears to be related to the occurrence of a systemic reaction to infection, but it cannot be regarded as a reliable guide either to the degree of systemic disturbance, or to the nature of the causative infection. Its more precise significance and its relationship to other types of serum flocculation reaction [8,9,10,17] is still being investigated. The fact that flocculation of chylomicrons is caused by the serum of these patients may, however, be significant in relation to the production of fat-emboli.

The occurrence of demyelination is an effect of lecithinase which might be expected, or it may be secondary to fat-embolism in the central nervous system. It is impossible to demonstrate free toxin in the blood-stream [14] although more remote effects are taking place. This may be due to the concentration in the blood being too low for the methods of detection available, and to the subsequent fixation of this toxin in the nervous system with a cumulative effect, or alternatively there may be a masking effect of the circulating toxin in the blood. We have not detected any obvious neurological symptoms in our animals, but these are difficult to elicit. In our clinical material some gross changes have been seen, but a more detailed study of this aspect of the problem is required.

Clostridial fat-embolism is of interest not only because it may be important in the pathology of clostridial infections but also because it may throw some light on the mechanism by which fat-embolism can occur in other surgical conditions. With regard to the origin of the fat in clostridial fat-embolism, there are obviously two possibilities. The first is the free fat which is liberated from adipose tissue and muscles, and can be seen as large globules in in-vitro studies and in the material from the site of tissue destruction. The second is from flocculated chylomicrons and the fatty material set free from broken lipoprotein complexes. In our experimental studies there seems little doubt that the fat must be derived from the site of local destruction, since in these animals the few chylomicrons present do not flocculate with the toxin, and the lipoprotein complex is resistant to lecithinase. Furthermore, fat-embolism can be demonstrated within an hour of injection of toxin, and the toxin even when acting on suitable human substrates will not produce free fat from the blood components for at least 12 hours. The precise mechanism by which the fat globules pass into the blood-stream is still under investigation. The origin of the fat in human subjects is more difficult to determine, especially as some of the cases also have fractures. There is no doubt however that extensive fat-embolism can occur in the human subject without any fracture being present. Whether or not flocculation of fat particles and the breakdown of lipoprotein complexes are important contributions to the clostridial fat-embolism syndrome in man is still to be decided.

Summary

The effect of *Cl. welchii* toxin on tissue and fluid substrates has been studied in vitro, in animals, and in human subjects, with special reference to the effect of lecithinase on structural lipids.

The direct local effects on connective tissue, striated muscle, adipose tissue, and peripheral nerve are described.

The action of the toxin on red blood-cells, chylomicrons, and plasma lipoprotein complexes are compared in guineapig and man. A chylomicron flocculation test has been devised and applied in human cases of clostridial infection.

Demyelination in the central nervous system can be demonstrated in vitro, and in experimental and clinical studies.

Fat-embolism can be produced experimentally by intramuscular or intraperitoneal injection of *Cl. welchii* toxin, and has also been demonstrated in human post-mortem material. The origin of the fat in the animal experiments is the site of local tissue destruction.

We wish to thank Sir Percival Hartley, FRS, for a supply of standard antitoxin, Dr. W. E. van Heyningen for providing the *Cl. welchii* toxin, Dr. H. J. Rogers for estimating its hyaluronidase content, and Miss M. G. Macfarlane for assaying the antitoxin titre of a number of sera. We are also indebted to the Sir Halley Stewart Trust for their financial support.

Since sending this paper to press it has come to our notice that R. G. Macfarlane and J. D. MacLennan have recently come to somewhat similar conclusions as a result of an independent investigation. We have had the advantage of discussing this unpublished work personally with Major Mac[illegible]hom we are much indebted.

References at foot of next column

FACTORS PROMOTING VENOUS RETURN FROM THE ARM IN MAN

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THE criticism by Roberts (1945) of current views on the mechanism of the venous return stimulated us to carry out the following two series of experiments.

RÔLE OF MUSCLE PUMP

The first series was performed to determine whether a combination of valves and contracting muscles ("muscle pump") could produce a rise of venous pressure in the absence of the vis a tergo; and to obtain some quantitative measure of any such rise in pressure.

Method.—The subject's arm was supported in the horizontal position at heart level. Three blood-pressure cuffs were placed round the arm: (A) a narrow cuff 2 in. wide round the proximal part of the upper arm; (B) a wide cuff 4 in. wide below this; and (C) a narrow cuff 2 in. wide below cuff (B), just below the elbow.

Cuff (C) was inflated to 80 mm. Hg pressure, and cuff (B) to 90–100 mm. Hg. After ten seconds, allowed for the filling of veins distal to cuff (C), cuff (A) was rapidly inflated to 210 mm. Hg to occlude the arterial inflow. Cuff (B) was then deflated and removed, leaving a segment of collapsed veins between cuffs (A) and (C). Thus the arm below cuff (A) was without arterial inflow or venous outflow. Cuff (C) divided the arm into two segments. Any blood passing from the distal to the proximal segment must overcome the pressure in cuff (C) and could be demonstrated by the filling of the veins in the collapsed segment between cuffs (C) and (A).

Findings.—When the arm was left in this condition for five minutes, no changes in the veins were observed, indicating that no blood was passing under cuff (C). On clenching and unclenching the hand six times, the veins in the collapsed segment between (C) and (A) filled with blood. Distension of the veins proximal to each valve in the distal segment was also observed, commencing 5 in. below cuff (C).

Repeating the experiment with increased pressure in cuff (C), the filling of the veins in the collapsed segment became less apparent, and at pressures over 100 mm. Hg it could not be detected.

These experiments showed that a combination of valves and contracting muscles (in absence of vis a tergo) can raise venous pressure to at least 80 mm. Hg (104 cm. H_2O).

RÔLE OF VIS A TERGO

Lewis and Grant (1925) showed that, after complete occlusion of the limb vessels, release of the limb circulation results in a greatly increased blood-flow through the limb, accompanied by dilatation of arterioles and capillaries (reactive hyperæmia). This effect was also

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observed when only the veins were occluded. Dilatation of the small peripheral vessels lowers the frictional resistance and permits more complete transfer of the arterial pressure to the venous side of the circulation.

Our second series of experiments was performed to demonstrate this transfer of pressure and ascertain its order of magnitude under varying degrees of peripheral dilatation occurring during reactive hyperæmia.

Method.—With the arm hanging vertically downwards, a 2 in. cuff was placed immediately above the subject's elbow, inflated [illegible] the veins should [illegible] left at this level [illegible] en lowered until blood flowed into the veins proximal to the cuff. This was observed in the following way. During the gradual lowering of the pressure a vein proximal to the cuff was collapsed by "milking" towards the heart and maintaining pressure on its proximal end digitally. When blood entered this vein from below the cuff, the vein immediately became distended, indicating that the venous pressure exceeded that in the cuff.

After obtaining an approximate value of the venous pressure by this method, subsequent readings were taken after rapid lowering of the pressure to the neighbourhood of this figure. By this means damming-up of blood in the veins distal to the cuff was minimised.

Findings.—The venous pressure increased with increase in the duration of arterial occlusion and the intensity of the resulting reactive hyperæmia. The range of occlusion durations was 3 seconds to 3 minutes. The corresponding venous pressures were 20–30 and 80–100 mm. Hg.

These results show that venous pressure due wholly to vis a tergo increases with the degree of peripheral dilatation. Under conditions of extreme vasodilatation, unaided vis a tergo may produce a venous pressure of at least 80 mm. Hg (104 cm. H_2O). It is to be noted that this value was obtained with the arm hanging vertically downwards and was therefore being exerted against gravity. As the cuff was 30 cm. below heart level (sternal angle), the effective venous pressure was therefore 134 cm. H_2O (100 mm. Hg). In other words it approximated closely to arterial blood-pressure.

DISCUSSION

It seems likely therefore that under conditions of rest venous pressure in a limb is to a considerable extent governed by the tone of the small peripheral vessels. When this tone is diminished, and the vessels are dilated, arterial pressure is transferred to the venous side more completely than when tone is high. The tone of the arterioles is in turn governed by the level of dilator metabolites, this depending on the degree of circulatory stagnation present.

A possible explanation of the control of the venous return from the extremities at rest thus presents itself. Slowing of blood-flow in the veins results in accumulation of metabolites, which by their direct action dilate the small vessels and allow more of the arterial pressure to be transferred to the veins; the rate of flow in the veins consequently increases.

I [illegible] a [illegible] de [illegible] indicate that two factors are involved in venous return in exercise: (*a*) dilatation of peripheral vessels increases the vis a tergo, (*b*) the combination of venous valves and contracting muscles greatly facilitates the venous return.

SUMMARY

1. Experiments were performed to obtain a quantitative estimate of two factors concerned in the mechanism of venous return.

2. The "muscle pump" alone can produce a venous pressure of at least 80 mm. Hg (104 cm. H_2O).

3. Venous pressure due to vis a tergo varies inversely with the state of peripheral vascular tone and can produce a venous pressure of at least 80 mm. Hg against gravity—i.e., 100 mm. Hg or 131 cm. H_2O effective pressure.

We should like to thank Prof. Samson Wright for his help and encouragement in the preparation of this article.

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HYPERTHYROIDISM TREATED WITH METHYL THIOURACIL

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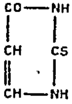
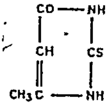
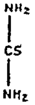
THE toxic effects of thiourea and thiouracil are comparable to those caused by the sulphonamides, which in large doses have a similar action in causing an iodine deficiency and subsequent goitre. The incidence and seriousness of these effects with thiourea (Newcomb and Deanes 1944, Welshman 1944, St. Johnston 1944, Haler 1944) have caused some apprehension among clinicians, and particularly among surgeons who have brought the operation of subtotal thyroidectomy to high perfection, with very low mortality. The proportion of individuals showing these effects with a minimum effective dose of thiourea for a minimum effective period is probably comparable to the incidence of toxicity in effective sulphapyridine therapy, and just as less toxic compounds have replaced sulphapyridine so thiouracil and other compounds are likely to replace thiourea because of the avoidance of serious toxic effects. One fatal case of agranulocytosis has been reported with thiouracil (Himsworth 1944). This patient had had long previous treatment with iodine and appeared resistant to treatment with thiouracil, the dose of which was held at 1 g. daily for 4 weeks and then increased to 2 g.

Another derivative of thiourea, 4-methyl thiouracil, [illegible] easily [illegible] de are


Thiouracil


4-methyl thiouracil


Thiourea

The purpose of this paper is to report the use of methyl thiouracil in 16 cases of hyperthyroidism.

METHOD AND RESULTS OF ADMINISTRATION

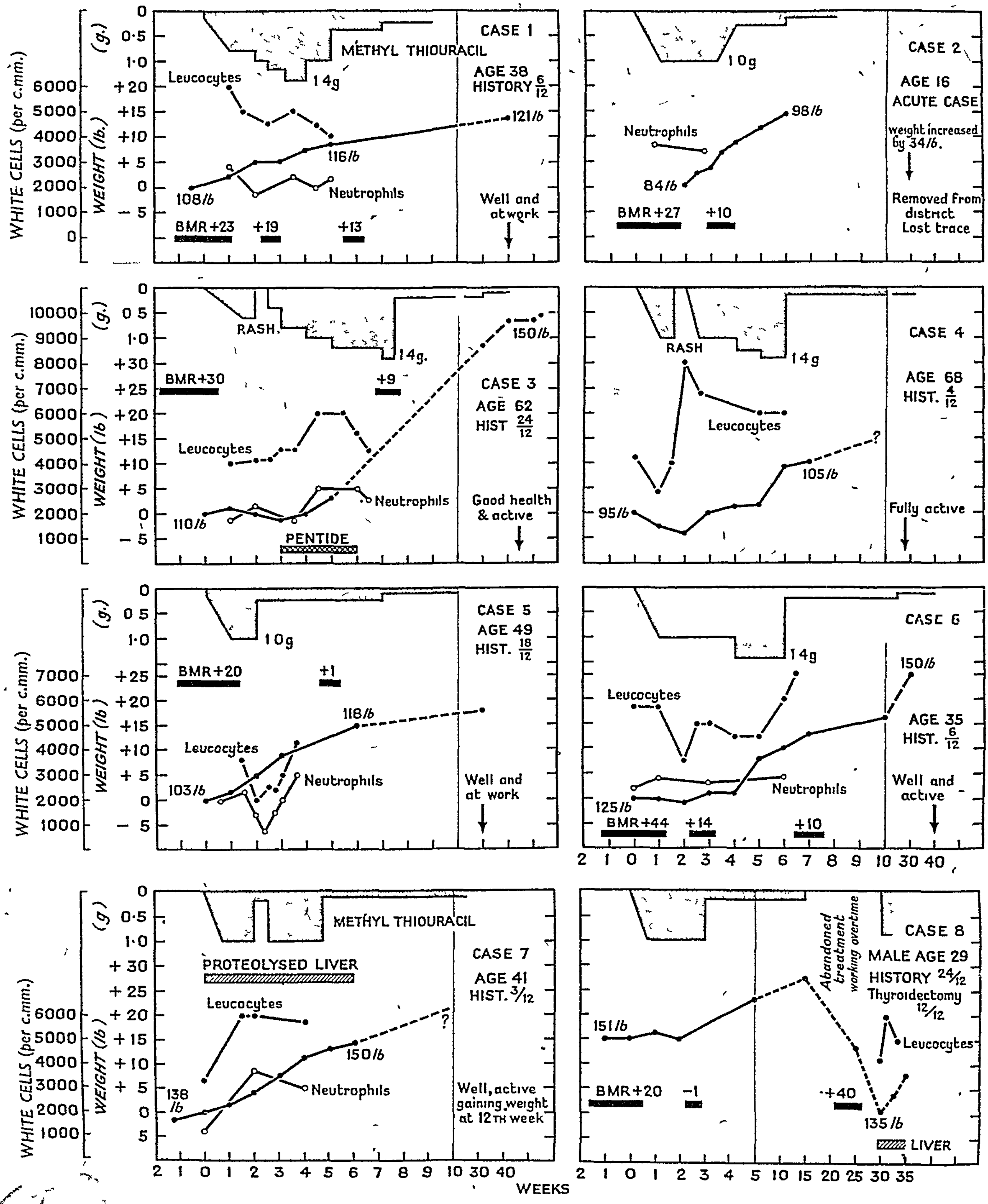
Methyl thiouracil was given in daily doses of 200 mg., stepped up by 200 mg. every day or every other day to the effective daily dose. At first this was thought to be 1·0 g., but in 3 patients a daily dose of 1·1 g. was used for a few days: later, it was thought wiser not to exceed a daily dose of 1·0 g., and in cases now under treatment the dose is being limited to 0·8 g. When a satisfactory rate of gain in weight was attained, a maintenance dose was substituted, of 200 mg. in the first cases, later of 100 or even 50 mg. Phenobarbitone was employed during the period which invariably occurs between the beginning of treatment with methyl thiouracil and improvement in symptoms. All patients had some enlargement of the thyroid gland; several had adenoma. Duration of symptoms ranged from a few weeks to 2 years or more. Ages ranged from 16 to 68 years.

The BMR was estimated either by Benedict's method [illegible] and in patients without [illegible] mula under the same [illegible] ing. Its determination [illegible] y than with other forms of therapy, and will be mainly useful in the differential diagnosis of anxiety states without hyperthyroidism, and to confirm or refute impressions of hypothyroidism consequent on atrophy. Observations on the blood-cholesterol were made routinely and were possibly as informative as the BMR.

There seems no reason to suppose that the careful use of thiouracil will result in such atrophy as will cause undesirable hypothyroidism, or at least that the risk of hypothyroidism will be any greater than with operation or any less amenable to treatment with thyroxine if necessary. Astwood (1944) has made some preliminary observations on the production of hypothyroidism in persons with normal thyroid function by the employment of daily doses of 100–600 mg. daily and has found that it requires treatment over several months to produce a fall in the BMR.

The results of treatment in these 16 patients fully bear out the reports already made by other observers of excellent progress under the influence of thiouracil. The case-reports are summarised in graphic form in the figure. A latent period was invariable and was protracted to 4 weeks in one patient previously given iodine; the shortest latent period was in a girl of 16, in whom striking effects were seen 10 days after the first dose of 0·2 g. (increased by 0·2 g. on alternate days). The type of goitre appeared to have no bearing on the rate and degree of improvement. The latent period was longer in the chronic cases, but chronicity did not prevent subsequent rapid progress. Euphoria was invariable. Gain in weight was rapid—one patient gained 14 lb. in 3 weeks, another 33 lb. in 4 months—and gain in self-confidence, and subsidence of tremor, sweating, and

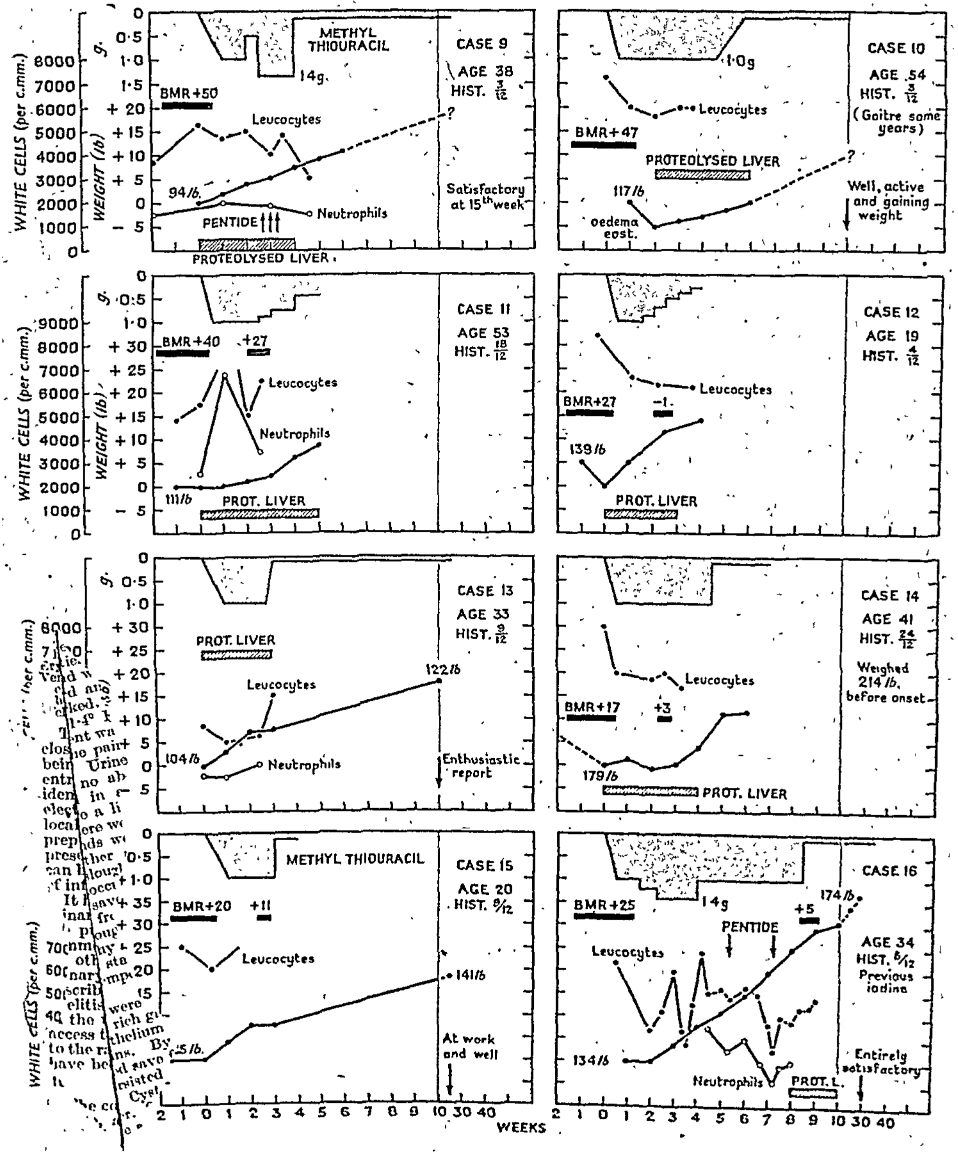
DOSAGE AND RESULTS (Cases 1–8)



palpitation were obvious. No case failed to respond. One patient, who had undergone partial thyroidectomy 6 months previously with only partial success, returned to work as a printer after gaining half a stone in 3 weeks; his BMR fell from + 23 to − 1 in this time. He then abandoned treatment and undertook several hours a day overtime work; although not under immediate observation at the time he discontinued treatment it appears that he began to lose weight immediately. A severe relapse ensued, to be followed by improvement directly methyl thiouracil was resumed.

ST depression in the electrocardiogram of an elderly subject disappeared under treatment; another patient had auricular fibrillation, which gave way to a sinus rhythm punctuated by frequent extrasystoles, which gradually disappeared.

DOSAGE AND RESULTS (Cases 9–16)



Size of gland.—The expectation is that the size of the gland should not be reduced by thiouracil treatment, and even possibly increased by thyrotropic pituitary action (Himsworth 1943). This was confirmed except in the very acute case of the girl of 16, in whom the hyperthyroidism was complicated by a tuberculous pleural effusion. Reduction in the size of the gland was here very obvious and coincident with clinical improvement. Exophthalmos and lid-lag, also expected to persist, were simultaneously reduced in this case.

Toxicity.—No case had any but minor toxic symptoms. Transient localised and non-irritant rashes appeared on the trunk in 2 patients. One of these had also a slight rise of temperature and mild diarrhœa; the drug was stopped for 3 days and then resumed without recurrence of symptoms. No late toxic effects were observed over periods of treatment up to 8 months. One patient complained of complete loss of taste when a daily dose of 1·4 g. had been reached; the symptom persisted as long as this dose was maintained and disappeared gradually when it was reduced; no other toxic symptoms accompanied it.

Effect on leucocytes.—Some depression of the leucocyte-count was seen in 8 out of 9 patients who were not given liver at the same time as their methyl thiouracil; the effect was mainly on the neutrophils but not confined to them. The depression was of the same order as that seen with full doses of some of the sulphonamides, and was transient in the sense that the count tended to rise again before the dose of thiouracil was reduced, but a further rise in the count was seen in some cases after further reduction of dose to 200 mg. or less. Himsworth (1944) considers the production of serious neutropenia in a given patient unpredictable except in point of time—i.e., if it is going to appear, it will do so during the first 2 weeks of treatment. Experience is awaited on two possible methods of prevention. First, the danger may be reduced or abolished by keeping to a minimum effective dose; Nussey (1944) saw no alarming leucopenia among 24 patients given a maximum daily dose of 0·6 g. thiouracil. Second, there is a possibility that patients may be protected from leucopenia by a diet rich in B-complex factors before and during treatment (Goldsmith et al. 1944).

A mild intercurrent infection in one patient under treatment put the white-cell count up from 6000 to 10,000 per c.mm.: in another the count was increased from 4000 to 8000 in 24 hours by the injection of 20 c.cm. of 'Pentide.' The sternal marrow of one patient during a period of moderate neutrophil depression was examined; no significant change was seen.

The eosinophil count was increased in every patient for whom serial differential counts were done, from absolute counts of less than 50 to counts of 200 or more per c.mm.; one patient had a count of 450. This eosinophilia is not prevented by oral doses of ½ oz. of "proteolysed liver" (Evans) daily, given simultaneously with methyl thiouracil. The eosinophil count tends to fall as the neutrophil count rises again, if this has been depressed, and the eosinophilia did not persist beyond the 4th week of treatment in any case.

CONCLUSIONS

We are ignorant of the cause of Graves's disease. There are few if any cases in which the evidence points to a purely local cause in the thyroid gland itself. Adenoma exists more often without than with hyperthyroidism. Proptosis, myasthenia, and possibly other features occur coincidently but dissociated from the symptoms directly attributable to an excess of thyroxine. Treatment, whether by rest alone, by sedation, by partial destruction of the thyroid through surgery or radiation, or with iodine or thiouracil, causes a decrease of circulating thyroxine. The disease is thereby cured either because the relative thyroxine deficiency produced lasts longer than the cause of overproduction, or because the original cause is itself augmented by the hyperthyroidism and disappears when this is corrected. The discovery of the action of thiouracil and related compounds on the thyroid gives us the power of regulating thyroid activity with an accuracy quite unsurpassed ther forms of treatment used for hyperthyroidism, eed unsurpassed in the whole field of endocrino- For the present, and until experience has fully determined the optimum conditions of treatment, it is best that these compounds should only be used by the specialist, with full laboratory control. The follow-up is exceedingly important, and should be under the supervision of the specialist also.

SUMMARY

Methyl thiouracil was used in the treatment of 16 patients with hyperthyroidism with good results; no toxic symptoms of importance were observed.

My thanks are due to Dr. A. N. Macbeth for her advice, and to Organon Laboratories, Ltd. for the methyl thiouracil used in these trials. I am also very grateful to Dr. E. J. Rounthwaite, to Dr. M. W. Hadley, and to Mr. P. A. L. Scott for their help in making observations and in blood-counts, and to Sister M. F. Skene for her painstaking supervision and keeping of records.

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IDIOPATHIC GANGRENE OF SCROTUM

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GANGRENE of the scrotum is not common, though presumably many cases are observed but unpublished. It was first reported by Baurienne in 1764 (see Gibson 1930), and since then 240 cases have been recorded.

CASE-REPORT

A man, aged 38, was admitted to Oldmill Emergency Hospital suffering from pain in the scrotum of 4 days' duration. He had enjoyed good health until the onset of this pain which was sudden and severe. The pain was constantly present and throbbing in character. It remained localised to the scrotum and did not radiate. The scrotum became red and œdematous on the 1st day and the inflammation increased in extent and severity for the next 2 days. By the morning of the 4th day the whole of the scrotum was involved, but the penis, perineum, and thighs were unaffected. There was no difficulty in passing urine, nor was the pain aggravat d by micturition. The man carried on with his Service du s as an orderly until the 4th day when he reported sick ar transferred to hospital. His appetite was unimpair general condition good. No other symptom was remar

On admission to hospital his temperature was 10 pulse-rate 96, and respirations 25 per min. The pati short, stout, plethoric, and somewhat dyspnœic. T had become easier and he lay comfortably in bed. was passed shortly after admission and contained normality. The scrotum was extensively involve acute infective process extending to its roots, wher of demarcation was forming near the perineum. Th several sloughing areas. No inguinal or other gla palpably enlarged, nor was there tenderness or o normality on rectal examination. Swabs from the area gave a profuse growth of an anaerobic strepto

On the morning of the 5th day the entire scrotum, fringe of skin about ½ inch in length depending perineum over the roots of the corpora cavernosæ, sl and left the testicles dangling clean, white and healt at the ends of the spermatic cords. Pain at this entirely absent and did not return, and the t settled.

The initial stages of regeneration of the scrotum and by the 7th day the testicles were covered by lations, while a healthy edge of regenerating epi growing circumferentially from the scrotal rema 28th day the scrotum had completely regenerat small area about ¼ inch in diameter which pe further 10 days before granulating over. examination showed no abnormality in the bladd showed only a moderate leucocytosis during th and the urinary findings remained constantly normal. The patient was given a course of sulphadiazine, 32 g. spread over 5 days, with a light but nourishing diet, and strict attention was given to the local hygiene of the affected part. Every care was taken to prevent introduction of infection into the bladder. He was catheterised on one occasion because of urinary retention. A suspensory bandage was worn after the slough had separated and the wound was dressed at first with tullegras, and later with cod-liver oil and sulphanilamide cream. Finally red lotion was used in the later stages of regeneration assisted by daily applications for 20 minutes of the infrared ray. During the convalescent period the patient was given large doses of 'Fersolate' and general ultra-violet irradiation. He was discharged to a convalescent depot 8 weeks after the onset of his illness.

[illegible] admitted to hospital complain- [illegible] left renal [illegible] abnor- [illegible] it was of [illegible] patient [illegible] had the gangrene." [illegible] being unlikely [illegible]

ÆTIOLOGY

The term "idiopathic" is unsatisfactory, for it suggests that the ætiology is unknown, whereas the condition is undoubtedly a manifestation of infection with particular organisms. In my own case, anaerobic streptococci were found, and streptococci have been found either alone or with other organisms in the majority of the 44 reported cases in which the bacteriology has been investigated. The organisms found in these were described as follows:

Streptococci in pure culture	23	Gram-positive cocci, facultative anaerobes	1
Streptococci and staphylococci	5	*B. proteus vulgaris*	1
Staphylococci	2	Gram-positive bacilli	1
Staph. aureus and *B. fluorescens*	1	*Cl. œdematiens*	1
Bact. coli	1	*Cl. septique*	1
Fusiform bacilli and spirochætes	1	*Cl. welchii*	1
B. fusiformis	1	*Cl. welchii* + secondary invaders	1
		Strep. pyogenes	1
		*B. gangrenæ cutis**	2

* *B. gangrenæ cutis* is an obsolete term and it is doubtful what organism was actually present.

In 125 out of the 240 cases coincident lesions have been found, as follows:

Systemic pyogenic infection (septic arthritis, perineal abscess, paraphimosis, gangrene of arm, erosion of penis, inguinal adenitis, &c.)	33	Trauma, from coitus, horse-riding, kick	21
Erysipelas of navel and hypogastrium	4	Phimosis	2
Erysipelas of scrotum	7	Use of antiseptics in skin preparation for operation (iodine and spirit)	2
Venereal infection (soft chancre, 1; gonococcal, 8; bubo, 7; syphilis, 6; chancroid 1)	23	Thrombophlebitis	2
		Accessory factors (hernia, hæmorrhoids, gunshot wound to buttocks, &c.) probably with no bearing on ætiology	31

The similarity of the condition to gas-gangrene is so close as to suggest the strong possibility of the lesion being an atypical form of that infection. The portal of entry of the infecting organisms is often impossible to identify, and it is difficult to determine why the site of election is the scrotum. In a proportion of cases some local septic focus—balanitis, phimosis, paraphimosis, preputial ulcer, or other similar predisposing factor—is present, but in a larger proportion no such local condition can be found, nor yet a general one to explain the source of infection.

[illegible] that there is an association with [illegible] This does not seem to be so from [illegible] nor does there seem to be any [illegible] th chronic cystitis, prostatitis, or other urogenital infection. Anaerobes within the urinary tract are not common, but *B. welchii* has been described in the absence of gas in cases of cystitis and pyelitis, and it may be possible for this organism to exist in the urine, and to penetrate the urethra thus gaining access to the loose scrotal tissues, which lend themselves to the rapid spread of acute inflammation. Trauma may have been a precipitating factor in some instances.

SYMPTOMS

The condition is typically sudden in onset, rapid in its [illegible]se, and found at any age from infancy upwards. It is commonest in the middle and later years, for only 26 cases have been described in children, the youngest being 5 days old. Usually the man has been healthy until taken suddenly ill with pyrexia, pallor, prostration, pain in the affected area, and the development of the local lesion. The first local sign is swelling and œdema of the scrotum, usually generalised, but at times strictly local, and possibly even confined to one side. Within 30 hours the redness has become dusky, and early gangrene is declaring itself. Œdema is gross and the scrotum presents the appearances of an acute infection. Retention of urine may render the patients even more miserable and the pain may spread upwards into the iliac fossæ. Desquamation of the more normal scrotal skin and pronounced sudorosis accompany an increase in the severity [illegible] fetid odour surrounding the bed [illegible] before the gangrenous process [illegible] physematous crackling in the part and gas can be detected in the loose scrotal tissues. Where the organism is a streptococcus this may not be so, and the outlook seems to be better in the absence of gas.

[illegible] it spreads rapidly and a [illegible] a few days. Spread is [illegible] the man's general con- [illegible] ication has formed, the general intensity of the infection subsides and within a few hours the affected scrotal area drops off, or is easily removed while dressing the part, and the testicles are revealed hanging free and appearing to be healthy. The tunica albuginea is unaffected. Most of the scrotum usually sloughs, leaving a healthy little fringe surrounding the base of the penis. In a more severe case, however, the gangrene may rapidly spread to the anterior abdominal wall, or even to the axillæ. Here, also, it is confined to the skin and fascial areas, and muscles are not involved. The more extensive the lesion the more intense is the systemic infection and the worse is the prognosis. During the period of separation of sloughs, hæmorrhage may be dangerous, but can be controlled with pressure and warm compresses.

The most remarkable feature of the condition is now witnessed—the extraordinary rapidity of regeneration. A rich granulating surface is early seen and epithelisation swiftly forms a new scrotum.

PROGNOSIS

Prognosis must be guarded in the early days, at least until the line of demarcation has formed and the slough been cast off. After that, the toxæmia becomes less and the outlook improves. Randall (1920) found the death-rate to be 32·1% and in 1931 Gibson's figure for 206 cases was 26·7%. The duration of the disease from onset to fatal termination varies from 36 hours to 36 days, and the cause of death is usually intense toxæmia. It is significant that the afflicted person is generally a robust adult in good health and presumably with powerful resistance to infection, yet he is struck down and overwhelmed with striking rapidity, a tribute to the virulence of the infection.

TREATMENT

In [illegible] out, [illegible] than [illegible] interference is not ideal. Operation is unavoidable when the gangrene spreads widely. The mode of extension is beneath Colles's fascia of the perineum and Scarpa's fascia of the abdomen, following the line of the fascial planes. These may therefore need to be widely incised, and it is important to be radical and speedy in performing debridement. The use of the sulphonamides or penicillin should substantially reduce the gravity of this infection, and is to be preferred to serum. Death is now less likely to follow in gas-gangrene infections where sulphonamides have been effectively administered and the same is likely to be true of this kindred condition. In a few years it should be possible to work out mortality figures following the conservative lines carried out in my own case, and I feel confident that chemotherapy will once again prove its worth.

In the past, bilateral orchidectomy has been performed when the testicles became exposed. This cannot be too strongly deprecated. Further, plastic operations for covering the raw area are quite unnecessary. A few weeks suffice for nature to effect all that is required, with the help of efficient nursing.

SUMMARY

In a case of so-called idiopathic gangrene of the scrotum conservative measures, including local and general sulphonamides, were adopted with a successful result.

A more suitable term would be acute infective gangrene of the scrotum, since this is undoubtedly a manifestation of infection, though a variety of organisms may be responsible.

An analysis of the 240 reported cases has been made from the point of view of age-incidence, bacteriology, associated lesions, signs, symptoms and complications, prognosis, and treatment.

Conservative methods of treatment are sufficient unless the gangrene spreads widely, since the scrotum rapidly regenerates in uncomplicated cases.

I wish to thank Dr. Harry Rae, Medical Officer of Health for Aberdeen, and superintendent of the hospitals, for permission to publish this report.

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RECOVERY FROM TUBERCULOUS MENINGITIS

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THE number of cases of tuberculous meningitis which have been seen to recover is extremely small. Of the two cases described, one, infected with human tubercle bacilli of low virulence, is of the rare group in which the diagnosis has been fully substantiated by culture and typing of the bacillus, and by an estimation of its virulence; this boy has been seen recently, 17 months after the onset of his illness, in robust health and working as a junior gardener. The other case unfortunately belongs to the rather larger group of cases in which tubercle bacilli were found in the cerebrospinal fluid during an attack of meningitis, but in which the organisms were not further tested as to their type and virulence; this patient, seen in 1938, changed her address and has not again been traced.

CASE-RECORDS

CASE 1.—A gardener, aged 16 years, was a well-developed boy with no significant past illnesses and no family history of tuberculosis. He was admitted to hospital on June 2, 1943, complaining of headaches of 4 days' duration, accompanied by vomiting and increasing drowsiness. On admission he showed definite neck-rigidity and his headache was chiefly frontal. Kernig's sign was at no time positive. When first seen his tongue was slightly furred and his temperature was 102° F. There was depression of the tendon jerks in the arms, and the knee-jerks were both absent, but the ankle-jerks were brisk. Both plantar responses were extensor. The cerebrospinal fluid was under normal pressure, but slightly turbid. Lumbar puncture was twice repeated, on June 7 and 17, and a full comparison of the findings in the cerebrospinal fluids from the three punctures is given in table I.

June 3: Headache almost gone. Still slight neck stiffness. One vomit. T. 101·4° F.
4: No headache. T. 101·2° F.
7: Second lumbar puncture. No return of symptoms. Evening temperature 98·8° F.
10: No neck-rigidity and no headache. Persistent constipation. Transient return of fever in evening (T. 101·2°F).
14: No fever for 4 days and no return of symptoms. Rt. plantar reflex now flexor; lt. doubtfully extensor. CNS otherwise normal.
16–19: Evening temperatures 99·2–99·6° F. No return of symptoms. CNS normal. Third lumbar puncture on the 17th (see table I).

TABLE I—CEREBROSPINAL FLUID: FINDINGS IN CASE 1

Date	June 2	June 7	June 17
Pressure	Normal	Low (75 mm. H_2O)	Low (70 mm. H_2O)
Appearance ..	Turbid	Turbid	Clear*
Protein	100	220	60
Pandy and Nonne Apelte	P + +, NA + +	P solid, NA + +	P +, NA +
Chlorides†	690	690	720
White cells per c.mm.	660	600	65
Lymphocytes ..	98%	98%	..
Tubercle bacilli ..	+	Scanty	–
Culture (Loewenstein)	Human TB	Human TB	Sterile

* = A little fibrin clot. † = mg. per 100 c.cm.

Subsequently up to the day of his discharge on July 8 he remained well and afebrile, and his sedimentation-rate (Westergren) gave a normal result. X-ray films of his chest and [illegible] taken in July, 1943, and November, 1944, showed [illegible] abnormality. Up to November, 1944, he had maintained full, normal health since his discharge from hospital.

The tubercle bacilli from this case were cultured by Dr. Hamilton Paterson and found to be a eugonic strain. That they were of human type was confirmed by injecting them into a guineapig and a rabbit. After a month the rabbit showed no infection, but the guineapig, killed at the end of 6 weeks, was tuberculous. Two months after their first culture Dr. E. Nassau also inoculated these organisms into both guineapig and rabbit and found them to be a human strain of low virulence. In just under 2 months the guineapig died of a "moderately generalised tuberculosis"; but the rabbit, inoculated at the same time, was quite healthy over 4 months after the inoculation.

CASE 2.—A single domestic servant, aged 41 years, was a normally developed woman with no significant past illnesses, though she had a brief attack of diarrhœa and vomiting [illegible] weeks before her admission. For 3 days before being sent into hospital she had had headache, fever, and stiffness in the neck. At admission, on July 17, 1938, her temperature was 100° F and pulse-rate 100 per min.; she was extremely drowsy and moderately disorientated. She showed well marked neck-rigidity and a positive Kernig's sign. There was also bilateral ptosis, more pronounced on the right side. She could not see with the left eye, and the left internal and external recti and right superior rectus all were weak. The right disc showed slight blurring of the edges. Pupils were equal and reacted to light but not to accommodation. The left side of the face showed some weakness of a lower motor neurone type, and occasionally the facial muscles on that side twitched. There was also increased spasm in the left sterno-mastoid muscle. The ears were normal. All tendon reflexes were brisk, and the right biceps jerk was brisker than the left. There were no abdominal responses and the plantars were flexor. On the day of admission lumbar puncture was performed and the cerebrospinal fluid was slightly hazy and

TABLE II—CEREBROSPINAL FLUID: FINDINGS IN CASE 2

Date ..	July 17	July 18	July 20	July 26	Aug. 1	Aug. 19
Pressure ..	200 mm. H_2O	180 mm. H_2O	Normal	Normal	Normal	Normal
Appearance	Opal. with clot	Opal. with clot	Sl. opal. with clot	Clear with web	Col. with small clots	Col. with many small clots
Protein* ..	400	450	..	..	..	100
Pandy ..	+ + +	+ + +	..	..	+ +	–
Chlorides*	620	630	..	670	700	750
Sugar ..	Nil	Nil	..	..	..	..
Lymphocytes	Nil	Nil	..	..	..	..
Polymorphs	+	+	+ +	..	..	..
Tubercle bacilli	–	–	+	–	–	–
Culture ..	Sterile	Sterile	TB	Sterile	Sterile	Sterile

* = mg. per 100 c.cm.; Sl. opal. = slightly opalescent; Col. = colourless.

under an initial pressure of 200 mm. There was no block (see table II).

July 19: A little less drowsy. T. 100° F. Neck stiffness and ptosis of rt. upper eyelid. Now no lt. facial weakness.
22: More alert and rational. No evident ptosis but still well-marked neck-rigidity. T. 101·2° F.
25: Very well and quite rational. Free for the first time from fever and headache. Neck still definitely rigid and Kernig's sign still just positive. A little weakness in deviation of eyes to left.
29: Continues well, but now has slight synovitis with effusion in lt. knee. Free from headaches, and neck-rigidity diminished. Kernig's sign negative. Temperature normal. (On six evenings in the following week it rose to 99–99·4 °F.)
Aug. 2: Synovitis now settled and no symptoms present.
9: Had slight occipital headaches on previous day and temperature of 99·2° F in the evening, but cerebrospinal fluid clear and under normal pressure.
30: Discharged to a convalescent home after being up and about the ward and free from symptoms for 3 weeks.

The Wassermann reaction in both blood and cerebrospinal fluid was negative, and radiograms of the chest and skull showed no abnormality.

DISCUSSION

In these two cases tubercle bacilli were found in the cerebrospinal fluid during illnesses which were both clinically clear examples of meningitis. The cerebrospinal fluid in each case showed confirmatory evidence of meningitis besides the presence of tubercle bacilli, and yet both patients became well enough to leave hospital. One of them is known to have remained well for more than a year, and in this case the meningitis was beyond doubt due to tubercle bacilli of human type.

There are few records of cases of this kind which have recovered. A different group of infections of the central nervous system by well-identified tubercle bacilli has been described by Macgregor, Kirkpatrick, and Craig (1934). Of their three cases, one with human and two with bovine tubercle bacilli in the CSF, two showed no evidence of meningitis either clinically or in the cerebrospinal fluid; one of these had no certain neurological signs and the other was most like an encephalitis; the first showed signs of otitis media, bronchopneumonia, and pleurisy; the second developed fever, headache, deep drowsiness, and delirium six days after slight injury in a car accident, symptoms which were relieved after a further five days by lumbar puncture. All three were young children and the only one with any meningitic features closely simulated poliomyelitis. As these writers point out, following the work of Rich and McCordock (1933), it is likely that their cases had developed very small tuberculomata in the nervous system and that these lesions healed; for all their cases recovered.

Cases which recovered after having full signs of
meningitis and
spinal fluid h
Parry (1934), a
tion another case described by Avanzinos in 1903. The case of Cook (1936), though a tuberculosis contact and clinically much like tuberculous meningitis, did not have tubercle bacilli in the cerebrospinal fluid. In the other cases no confirmatory tests were performed on the tubercle bacilli which were found.
to note that Plazy and Mondon,
illness was in many respects
gested that an organism of low virulence had infected their patient. Hobson's case resembles case 2, having a severe and long illness, cranial nerve weaknesses (the seventh and eighth nerves), and transient joint symptoms, these last presumably due to a tubercle bacillæmia. Neither of the present cases showed any evidence of miliary tuberculosis, nor is any apparent from the accounts of the other cases quoted. It appears that the meninges in all cases of this kind are infected from previously formed small tuberculomata in the central nervous system. In Hobson's case there is much evidence to support such a sequence of events, while in the cases of Macgregor, Kirkpatrick, and Craig the illnesses may well have been due to the development of small tuberculomata in the brain and cord without any subsequent meningitis.

In a thorough examination of the brains and meninges of a large series of cases of tuberculous meningitis, Rich and McCordock (1933) found strong evidence of small tuberculomata being present in the great majority before the onset of meningitis. Their experimental injections

servations led them to conclude that the development of

eninges or ventricles."
T follow from this menin-
g the cases mentioned in
this paper, and case 1 seems to indicate that when recovery takes place the infectious tubercle bacilli are of low virulence.

I am indebted to Dr. J. Hamilton Paterson and Dr. E. Nassau for help with pathological investigations.

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ACTIONS AFTER BEING SHOT THROUGH THE BRAIN

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It is of course well known that considerable power of voluntary movement may be present after gunshot wounds of the brain, but in the following case the extent of the movement after being shot through the brain with a ·45 Service revolver was exceptional.

A professional man, aged 62, was depressed owing to financial and domestic
suffe spected that he was
his ir eft letters indicating
informed a friend of
this intention the previous evening.

On the night of the incident he evidently spent a considerable time in a summer-house in the gardens in front of his lodgings and smoked about 20 cigarettes before shooting himself. That he shot himself in the summer-house was shown by a bullet hole in the roof, particles of brain matter adhering to the rafters, and a ·45 Colt revolver on the floor. The exact time he shot himself is not known, but he must have remained unconscious for some hours. Snow began to fall at 6 next morning, and within an hour there had been a heavy fall. About 7 A.M., after it had stopped snowing, he had staggered from the summer-house in an attempt to reach his own house across the street. At first he was very uncertain of his movements. His footsteps could be traced in a rough circle round the gardens from tree to tree and back to the summer-house, a distance of 165 yards, where he apparently had a rest. He then recovered further and walked up a narrow path, unlocked the garden gate with his key, walked across the road to his house, making a total distance of 300 yards. At 7.30 A.M. he rang the bell of his house. The landlady opened the door and the man said quite clearly to her, "I must go to the bathroom." He then placed his umbrella in the umbrella-stand, was helped off with his overcoat, and assisted to the bathroom on the ground floor where he became unconscious. He was removed to hospital where he died 3 hours later.

I carried out an autopsy next morning. The bullet had entered under the lower jaw on the left side

and emerged through the left side of the frontal bone leaving a hole 1¼ inches in diameter in the skull.

SUMMARY

A man aged 62 shot himself through the head with a ·45 Service revolver. The bullet passed through the centre of the left frontal lobe. After an interval he recovered sufficiently to walk 300 yards, carry out numerous actions, and speak clearly before collapsing. He died 3 hours later.

Preliminary Communications

ABSORPTION OF AEROSOL PENICILLIN VIA THE LUNGS

THERE are still occasions when the administration of penicillin may present difficulties. Pain from repeated or long-continued injections, extreme youth of patients, rapidity of excretion, and the destructive effect of the gastric juice all introduce therapeutic handicaps. But one possible procedure which has received little attention might well circumvent some of these difficulties—the absorption of penicillin via the respiratory tract, particularly the lungs. Mutch and Hoskins[1] have demonstrated that a person inhaling, through a small rubber nose-mask, droplets produced from aqueous sulphonamide solutions nebulised in a Collison apparatus, absorbs the drug in therapeutic quantities, and they suggested that penicillin might be administered by similar means. But any form of mask has obvious disadvantages when administration must be protracted or the patient is very young or extremely ill. We therefore decided to use true aerosols of penicillin—mists composed of such very small particles that they long remain suspended in the air and quickly penetrate to distant parts of a room. Antibacterial aerosols, such as those of resorcinol, hypochlorous acid, the glycols, and lactic acid in non-irritating concentrations can be readily inspired.[2] The same obviously applies to penicillin. But, owing to its relative instability and liability to oxidation, it was essential to know how long penicillin remained active in aerosol form.

ACTIVITY OF AEROSOL PENICILLIN

An electrically driven generator was chosen which did not raise the temperature of the solution and could disperse an accurately measured amount. We found that at room temperature a penicillin aerosol remained fully active for at least 90 minutes, often much longer. To quote a typical result, in a closed space of 1072 cubic feet we dispersed, over a single period of 60 sec., 1·5 c.cm. of aqueous aerosol sodium penicillin (10,000 units per c.cm.), thus producing an initial air concentration of 1·5 units per cubic foot. One and a half hours later the suspended penicillin could still completely inhibit the growth on blood-agar of a group C hæmolytic streptococcus, atomised from a broth culture into the room. The effect was tested by taking air at 15 minute intervals, a cubic foot at a time, into a Bourdillon slit-sampler kindly lent by the designer.

As an example of the distance from the generator at which the effect may be obtained, using a larger room (3000 cu. ft.) and running a smaller generator designed for use in hospital, we noted complete inhibition of the organisms on blood-agar plates previously inoculated with *Staph. aureus* (500 colonies per plate) at distances of 25–30 feet. In this case the generator was run continuously for an hour, meanwhile dispersing into the air 20 c.cm. of aqueous sodium penicillin of strength 10,000 units per c.cm. At first 10 minutes after starting the generator, 15 minutes' exposure at 25 feet was needed to achieve complete inhibition on the previously inoculated plates. Towards the end of the hour the inhibition time fell to 5 minutes' exposure or less.

RESPIRATORY ABSORPTION DIRECT FROM THE AIR

Satisfied that the aerosol remains active and can be projected many feet, we then turned to direct inhalation experiments. The preliminary tests had involved the continuous presence of one or other of us in the closed rooms and we had already noticed that afterwards our urine invariably contained penicillin. The small generator was set up at one end of the 3000 cubic foot room, and, with door and windows closed, was run continuously to disperse 20 c.cm. of sodium penicillin in water (10,000 units per c.cm.) during an hour. Meanwhile we simply sat in the room and read. The distance of the face from the generator varied on different occasions between 4 and 6 feet. The generator stood 4 ft. 6 in. above the floor.

Before sitting down in the room the bladder was always emptied and a specimen kept. The greatest care was taken not to swallow while in the room. Breathing was as much as possible through the mouth with the nose held or covered. All saliva was expectorated into a covered Petri dish and the mouth occasionally washed out with distilled water. Breathing was of average normal depth. There was no respiratory or other discomfort, no coughing, and no conjunctival or nasal irritation. The times of exposure ranged from 15 to 30 minutes. On leaving the room all skin surfaces from which penicillin could possibly be derived were at once washed. A urine specimen was collected 15 minutes later.

Both of us made numerous tests on ourselves and on four adult volunteers. On every occasion considerable quantities of penicillin could be detected in urine secreted after 15 minutes or longer in the room. The usual standard methods of penicillin detection were used. The pH of the urines was first adjusted to neutrality and a control always run with the urine passed before exposure. The average result of 15 minutes' exposure was a urine completely inhibiting the growth of a sensitive *Staph. aureus* in a dilution of 9 parts of broth to 1 part of urine. By increasing exposure up to 30 minutes, it was easy to obtain a concentration giving inhibition in broth 19 parts to urine 1 part. Tests were also made on blood collected immediately on leaving the room. After exposure varying from 15 to 30 minutes the inhibition range, using a moderately sensitive β-hæmolytic streptococcus, fell between 1 in 2 and 1 in 3 dilutions of the blood. The concentration curves are now being worked out in detail, but the preliminary figures show that aerosol penicillin can be absorbed in therapeutic quantities via the respiratory tract and this direct from the atmosphere of a room, without the use of any form of mask and without the recipient suffering the least inconvenience or discomfort.

DISCUSSION

The possible clinical applications of aerially distributed inspired penicillin appear to be numerous. In a room or small ward of, say, 4000–5000 cubic feet several adults, and even more children, could be treated at the same time without disturbing them in any way or even while they slept. For individual patients, particularly small children, the aerosol might be administered by any simple "tent" technique. Small aerosol generators can be activated through pressure from an oxygen cylinder. There is no need to waste penicillin if spatial conditions are adjusted appropriately.

The most obvious application seems to be in pneumonia, bronchial infections, and carrier conditions, particularly in very young patients. But when for any reason repeated or protracted injection is impracticable, the aerosol method could be adopted for practically any form of penicillin-sensitive infection. Moreover, aerosol distribution of penicillin, since it can produce complete bacteriostasis on surfaces 20 feet or more away from the generator, might be of value in the operating-theatre when the risk of secondary infection is high or when difficult septic dressings are done. With regard to respiratory infections we have already experienced several apparent successes and observations are proceeding. But the possibilities seem to range over such wide fields that our present object is simply to call attention to the experimental facts as they stand in the hope that those with better opportunity than ourselves for clinical experiment will carry the matter further.

SUMMARY

Aqueous sodium penicillin remains active for a considerable time when dispersed as an aerosol.

Penicillin inspired in this form, without the use of any mask, readily passes into the circulation, is excreted in the urine, and can soon be detected in the blood in therapeutically useful concentration.

It is suggested that the administration of penicillin by this means may have several useful clinical applications.

Continued at foot of next column

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Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the section of experimental medicine and therapeutics on March 13, with Dr. E. N. ALLOTT, the president, in the chair, a discussion on

Blood Coagulation

was opened by Dr. R. G MACFARLANE, who surveyed the factors concerned and [illegible] ad to abnormal bleeding, or [illegible]. This field, so long one of acade[illegible] at last bearing the fruit of pr[illegible] at least of the faults in the coagulation mechanism could now be corrected. In the various hæmorrhagic disorders associated with hypoprothrombinæmia vitamin K was saving many lives. The treatment of hæmophilia was unfortunately still only symptomatic, but improvements in the use of local coagulants was increasing their efficacy. Recent work was promising to show that the clotting defect was an excess of anti-kinase, and once this was established there would be a firm basis for research aimed at the general treatment of the condition. Not less important were the advances in the control of intravascular clotting. The increasing use of heparin, and to a less extent of dicoumarin, was reducing thrombosis an[illegible] ope of vascular surgery [illegible] Finally there was the [illegible] a physiological dressing. Dr. Macfarlane had employed it in 1941 in the form of sheets to cover burns, with partial success, an[illegible] America [illegible] erties of [illegible] effect as a [illegible] in brain surgery, and combined with thrombin as a hæmostatic filling that could be left in situ to be disposed of by the normal process of repair.

Dr. HAROLD SCARBOROUGH, discussing the mechanism of neonatal bleeding, the most important hæmorrhagic disease due to a low plasma prothrombin, said that a number of factors are responsible—prematurity, impaired maternal contribution of prothrombin or vitamin K, defective synthesis of vitamin K in the intestine or of prothrombin in the liver, defective secretion of bile, limited absorption of fat, gastro-intestinal hypermotility, and a low content of vitamin K in milk. Turning to the indications for vitamin-K administration, he explained that, in obstructive jaundice, biliary fistula, and steatorrhœa in adults the plasma prothrombin tended to fall gradually, whereas in conditions of disturbed intestinal motility falls were more rapid. After surgical operation in jaundiced patients, and in patients with liver disease, the plasma prothrombin might fall rapidly to a dangerous level even though it was normal before operation. In the absence of severe liver disease, the plasma prothrombin could be quickly restored to normal by the parent[illegible] had prognostic significance. Gross liver damage could, however, be present with a normal plasma prothrombin, and a low plasma prothrombin was certainly not the only cause of a bleeding tendency associated with disease of the liver. A positive K response test partly depended on the level of plasma vitamin A, itself often reduced in liver disease. Dicoumarin increased the prothrombin time but had many other effects which were [illegible] it was inferior [illegible]

The PRESID[illegible] misgivings on the [illegible] ase [illegible]

Continued from previous column

We are indebted to Phantosol Products Ltd., of London, for the loan of the aerosol generators used in these experiments, and to Mr. A. C. Lock, MIEE, for technical advice.

F. A. KNOTT	W. H. CLARK
MD, FRCP, DPH	FIMLT
Bacteriologist to Guy's Hospital.	Technician in the Department.

in which severe hæmorrhagic symptoms developed after its use, but which were controlled by blood-transfusion.

Dr. E. FREUND thought that the detachment of intravascular clots to form emboli was due to a weakness of the clot itself, and claimed that the administration of calcium [illegible] 1 this.

Mr. A. [illegible] with reference to the intestina[illegible] K, that the bacterial flora of [illegible] atal period should be studied, and the effect of cow's milk as against human milk considered. In vitamin-K therapy it was the synthetic analogues that were used, and in these the [illegible] ption of the [illegible] eliminated. [illegible] the jaundice of hepatitis the hæmorrhagic tendency was not due only to the low prothrombin level, since in some cases there might be bleeding when that level was normal; in such cases abnormal capillary responses might be a relevant factor.

Dr. ELI DAVIS, in his experience of 500 cases of purpura, had observed only 4 cases of prothrombin deficiency, while in 10 cases of scurvy all were normal in this respect.

MANCHESTER MEDICAL SOCIETY

ON March 7 Dr. G. S. SMITH opened a discussion on

Penicillin

He reviewed the first 100 cases receiving penicillin treatment in the Manchester municipal hospitals as follows:

(1) Of 13 cases of osteomyelitis all showed good results; but penicillin did not prevent development of a local abscess in bone or periosteum, which always required surgical treatment.

(2) Of 10 patients with septicæmia (8 staphylococcal, 1 *Streptococcus pyogenes*, and 1 non-hæmolytic streptococcus) 7 recovered after seven days' full systemic treatment and 1 died of pericarditis.

(3) Of 15 adults with pneumonia, who had failed to respond to sulphonamides or were unsuitable for sulphonamide treatment, all but 2 showed improvement in general symptoms: these 2 had deep empyemas. In this group 5 died, 4 from bacterial endocarditis and 1 from acute nephritis present before the pneumonia started. A group of 17 infants and young children had bronchopneumonia, mostly following whooping-cough. Here the bacteriology was uncertain but penicillin was tried after the failure of sulphonamides: 12 did well while 5 died (2 within four hours of starting treatment). Long-continued treatment was necessary in these cases, the response being rather slow and a second course was sometimes needed.

(4) In 6 cases of empyema (4 in children and 2 in adults) penicillin was given locally to sterilise the pus in the chest followed by drainage in each case. The results were satisfactory.

(5) In 9 cases uterine sepsis followed pregnancy or abortion and failed to respond to sulphonamides. The infecting organisms were *Strep. pyogenes* (5), *Staph. pyogenes* (2), and *Cl. welchii* (2). All the patients recovered except 1, who died before penicillin could have had any effect.

(6) In 4 cases (3 women and 1 man) with long histories of unsuccessful sulphonamide treatment for gonorrhœa, response to penicillin was rapid.

(7) In 3 cases of cavernous sinus thrombosis, all staphylococcal in origin, recovery followed intensive penicillin therapy, although 1 patient died some months later from staphylococcal arthritis of the hip-joint.

(8) Intrathecal penicillin was [illegible] gitis, from 1 of whom a [illegible] *influenzæ* was isolated. ([illegible] and intrathecal penicillin twice daily for six days.) All 4 recovered.

(9) A group of 20 patients with severe local sepsis, mostly staphylococcal, showed results that were generally good; 1 patient with a severe anthrax lesion on the face responded well.

Prof. JOHN MORLEY thought that in civilian cases penicillin is most suitably given by continuous intramuscular drip. This required a trained nurse all the time.—Dr. H. J. VOSS said in cases of puerperal fever and white leg it was necessary to continue penicillin treatment for a very long time.

Reviews of Books

National Health Insurance

Study IV of the National Institute of Economic and Social Research. HERMANN LEVY. (Cambridge University Press. Pp. 355. 18*s.*)

WITH footnotes on every page, and with an ample array of detail, comes another "critical study" from the pen of Professor Levy. His preference for retaining the connexion between medical services and cash services was presented to readers in these columns (1943, ii, 516). Since that time opinion in this country has so solidly settled in favour of separation that further discussion becomes academic. The citation of the experience of other countries has, perhaps, less significance now than it had before experience was gained here. His book was written before the publication of the Beveridge report; and he was unable to give more than a postscript of 6½ pages to that famous document. If some of his criticisms—such as that of the approved society system—have already been met, his chapters will at least contribute to the history of the experiments of the last two or three decades.

The book in places reflects the tendency to assume that, because you can make a revolution at an appointed day in the rates of cash benefit and the organs of their administration, you can also, at a fixed point of time, achieve a revolution in social medicine. Perhaps not enough allowance is made for what has already been accomplished—e.g., in the statement that "Medical Benefit, which is only partly effective, is wholly inadequate" which even in its context seems hardly to reflect the judicial temper of pure research.

As usual the chapter headings are well furnished with apt quotation. It was the author or his former collaborator who, in a previous volume, quoted Lord Rosebery as saying: "Politics are dull as ditchwater, but ditchwater is interesting and instructive when looked at through a microscope." It might be said that National Health Insurance is dull as ditchwater, but can be interesting and instructive when looked at through a microscope—especially when the microscope is adjusted by the painstaking fingers of Prof. Hermann Levy.

Hale-White's Materia Medica

Pharmacy, Pharmacology and Therapeutics. (26th ed.) Revised by A. H. DOUTHWAITE, MD LOND., FRCP. (Churchill. Pp. 534. 14*s.*)

IN general plan this classic is an unofficial pharmacopœia, giving essential details of all official drugs and preparations and including a number of unofficial remedies selected with discrimination. The drugs are arranged in groups according to their therapeutic applications. The catalogue is relieved by paragraphs on actions and toxicology; and simple direct writing and careful selection of subject matter has made it possible to include much useful information in about 500 small pages. The pharmacognosy also is ample for the doctor, though inadequate for the pharmacist, but lacking the background of experiment and philosophy is only suitable for ancillary use by medical students.

The Lady of the Hare

JOHN LAYARD, MA, D SC. (Faber. Pp. 277. 12*s.* 6*d.*)

THE two books here loosely associated in one cover have as their common postulate the Jungian belief about archetypes in a collective unconscious. The first part of the volume describes the treatment of a defective and perhaps schizophrenic girl by the analysis of some of her mother's dreams: the second—which will be the more interesting to most people—collects the folklore and mythology of the hare in various countries. A hare had been sacrificed in a dream by the woman whose brief analysis is described in the first part of the book, and the author labours with much erudition to prove that the hare represents pre-eminently the psychological function of intuition, to which Jung has attributed such potency and value. A lucid style and a fervent wish to persuade the reader make the book an attractive one, but as a document it is a startling reminder of how remote the methods of analytical psychology can be from those of the physical or social sciences. When Mr. Layard says that septicæmia is "due to lack of spirituality quite as much as to lack of merely physical hygiene," and that "one of the subtlest illusions of all (is) the belief that disease of the body is anything other than a disguised disease of the soul," he betrays as odd an outlook, judged by medical standards, as when he describes the later hallucinated state of the young patient as an indication of her gratifying degree of improvement. But then he is not a doctor, and his book underlines the objections that doctors commonly advance against the practice of psychotherapy by people not medically trained, however gifted, scholarly, and upright they may be.

Shoulder Lesions

H. F. MOSELEY, DM, FRCS, FACS, lecturer in surgery, McGill University. (Baillière. Pp. 181. 25*s.*)

IN Codman's masterpiece on the shoulder there is a well-known cartoon of the author looking through his window at a workman with an injured shoulder, and wondering how to induce him to come for early treatment. A corresponding drawing in this book shows Dr. Moseley's consulting-room thronged with patients, their arms in slings. This is a measure of progress in treatment of shoulder lesions since Codman's time; he lamented never having sutured a ruptured supraspinatus immediately—today it is a commonplace. This book does not claim comparison, for it does not pretend to be more than a practical approach to shoulder problems, based on the author's own cases. He correlates recent material on the use of procaine in diagnosis and treatment; earlier recognition of supraspinatus rupture; the scalenus syndrome, and prolapsed cervical intervertebral disc. The result cannot but be helpful to the busy orthopædic surgeon, who may have forgotten how many angles of approach there are to shoulder pain and dysfunction. The only omission is a lack of reference to the syndrome of costoclavicular compression, and this should be remedied in the next edition.

The History of Cæsarean Section

J. H. YOUNG, MB EDIN., DTM & H. (H. K. Lewis. Pp. 254. 16*s.*)

As Prof. Miles Phillips points out in a foreword to this well-written book, Dr. Young gives the most complete history of the origin of the term cæsarean section and of the actual operation itself so far published, and he also deals with the stages through which its technique has progressed. He had access to the Thomas Radford library of Manchester University which houses one of the world's finest collections of works on midwifery. His bibliography and the liberal extracts from original works indicate the thoroughness of the study.

The Precentral Motor Cortex

Editor: PAUL C. BUCY, MS, MD. (University of Illinois Press. Pp. 605. $4.50.)

THIS monograph, of 18 chapters, each written by an expert, sums up the present state of our knowledge of the motor cortex. The motor area was the first part of the brain to yield clear evidence of localisation, and Ferrier's book in 1876 described the main results of electrical stimulation. At present one of the most fruitful lines of research is that introduced by Dusen de Barenne, for tracing cerebral connexions by the local application of strychnine. This is described by his colleague Warren McCullogh. Margaret Kennard deals with the autonomic functions of the precentral and frontal areas, and recent work on the histology and function of the pyramidal tract is discussed by Levin and Sarah Tower. The editor deals with the effects of extirpation of the precentral cortex in man and with its relation to abnormal involuntary movements. And von Bonin's detailed account of the architecture of this part of the cortex will help to clear up the confusion which has arisen from a lack of agreed nomenclature. The volume is a standard work of reference for the neurologist, the neurosurgeon, and those undertaking research on the brain.

". . . The revolt against over-lecturing is natural, but can, I think, be overdone. Spoon-feeding would be as bad as under-nourishment."—RAYMOND PRIESTLEY, *Nature*, March 31, 1945, p. 383.

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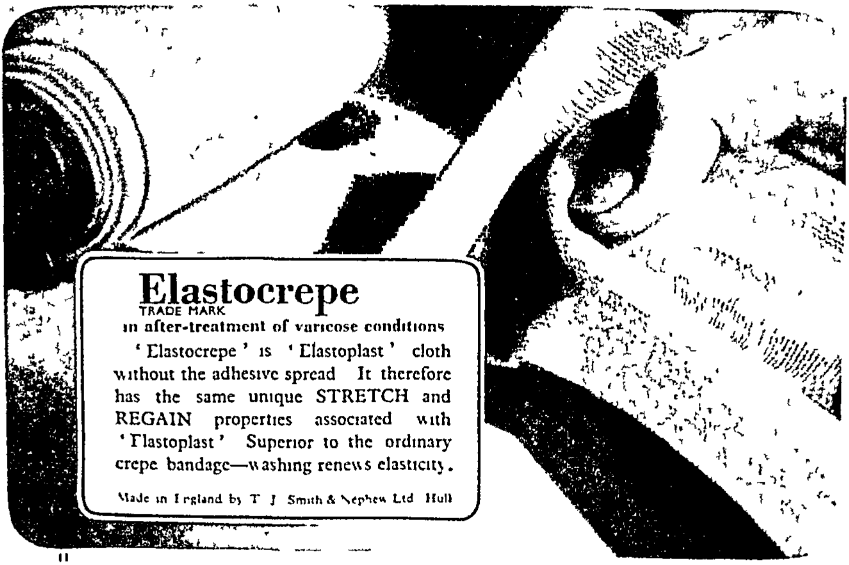

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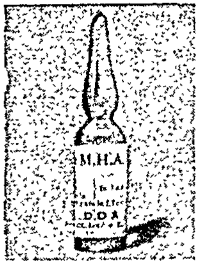

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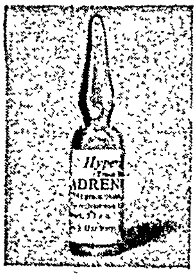

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THE LANCET

LONDON: SATURDAY, APRIL 14, 1945

General Post?

It was a civilian who proposed in our columns six months ago[1] that "as soon as the German war ends, a wide interchange of Service and civilian doctors should be arranged." But the profession in this country may not yet realise how strong the demand for [illegible] medical me[illegible] two or thr[illegible] waddy, the [illegible] raised : "Why can't the people in the EMS come out and take their turn ? Why should they go on gaining professional experience and higher degrees while we remain year after year cut off from the kind of medicine we shall have to practise later ?" It may be that people abroad are not always quite fair to people at home, many of whom have always been very anxious to take their share of foreign service. It may be that on demobilisation those with field experience will find themselves at less of a disadvantage than they now suppose. But a completely objective outlook cannot reasonably be expected of men who have been separated from their homes and normal life for years on end—often at distances so great, and in circumstances so strange, that they might almost be living in another world. And if (as is true) there is gain as well as loss from entering the brotherhood of arms, it is a gain that in war-time as many as possible should share. There is a growing danger of cleavage of the profession after the war into two parts—those who wore the King's uniform and those who did not. The only way to escape this danger, and do justice, is to arrange that before demobilisation is complete, every fit young doctor shall have served his turn. Not all will have been at Alamein or Arnhem, but both in East and West there are all too many memorable battles still to be fought. Not only war but its followers, famine and epidemics, have their St. Crispin's days.

The heads of the medical services concerned are well aware of the feeling abroad, and are very willing to facilitate the interchange asked for. But they have to show reason why serving doctors should be treated differently from, for example, serving engineers or artisans, who may feel just as strongly that they should now change places with their opposite numbers at home who are earning good money on munitions. Why should the medical officer, who generally has a better war than the combatant, be singled out for early replacement and return to civil life ? One answer is that the medical profession, with its long training, limited intake, and large responsibilities, is in a special position requiring special arrangements if it is to cover its whole field as efficiently as possible : each year that a doctor spends away from ordinary medical work makes it harder for him to resume it. A second answer is that unless special action is taken doctors will probably be demobilised *later* than other officers of equal service, for a great many will be needed by the Forces during the periods of occupation and demobilisation : the formula for demobilisation according to age and length of service may have to be set aside in quite a number of cases because of the overriding "military necessity" for retaining a medical officer who holds a key position. A third answer is that interchange of civilian and Service engineers or artisans is impracticable, because it takes a year or two years to turn a civilian into a sapper or an infantryman. In the medical services, on the other hand, there are many posts that a civilian doctor can fill satisfactorily after very brief training, and the proportion of such posts will quickly increase as actual fighting diminishes.

Being agreed that interchange on the largest possible scale is necessary to keep the profession fit to perform its duties, how can it be achieved ? At first sight it may seem difficult or impossible, because there is a shortage of doctors everywhere : since the interchange cannot be instantaneous, the services of the men concerned will be lost while they are travelling or training, and the loss, it may be said, cannot be afforded. But this is one of the cases where the difficult should be done at once though the impossible may take rather longer. The end of the German war will remove the need to keep large numbers of beds open for convoys of wounded and for air-raid casualties, while the coming of summer usually reduces the pressure in general practice. The relief thus given should be enough to allow exchange of duties, while a change in the nature of European service should also permit the Army to make wider use of women medical officers. We suggest that, by way of preparation, every local medical war committee should be instructed to review its list of serving practitioners and consider in each case whether, if the officer were released, he could be replaced by calling up a partner or neighbour who has not yet served in the Forces. Similarly each hospital medical committee should consider whether members of their staff could take the place of those now abroad.

So far we are advocating nothing more than expedition of processes already familiar ; and it is only when one comes to the whole-time hospital appointments that new procedure seems necessary. A local medical war committee can offer to exchange one of its practitioners for a man now in Burma, because it knows that the Burma man, on his release, will come back to his old [illegible] members of [illegible] in the same [illegible] his place. It is true that many who entered the Forces within a year or two of qualification would be thankful to continue their hospital training where it left off, but unless special conditions of release were laid down they would be under no obligation to fill any particular vacancy. There is no machinery of civilian direction that would oblige released Service officers to take over the civilian hospital posts vacated in their favour, and unless the authorities could be sure that each post would be rapidly taken they could not allow the present holders to join the Forces. Thus it seems that interchange of Service doctors with those now in junior hospital posts can be arranged only if the released doctors will consent to enter a pool from which they would be allotted to the most suitable hospital posts in the neighbourhood they preferred—provided the hospital authorities would agree to appoint them. Besides this restriction of choice required by war conditions, they would generally suffer loss of income through transfer from the Services to a junior hospital appointment. But the advantage of getting back to normal medicine in this country would for many of them outweigh the disadvantages both of continued "regimentation" and decrease of salary. And the profession, which serves the nation, would gain much by their earlier resumption of their chosen career.

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[1] *Lancet*, 1944, ii, 458.

Enough has been said to show at least that the restrained cries of our colleagues overseas have been heard in London and approved in principle. To translate the principle into practice is not at all easy, and suggestions from those affected would be welcome. Easy or difficult, however, the men and women discouraged by long service abroad must be relieved and brought home, so that they shall not lose touch with their profession. The war has already lasted so many years that some of the disabilities of absence must now be shouldered by those who have so far served only at home.

Thiouracil

A DAILY dose of thiouracil can be relied on to remove most of the manifestations of thyrotoxicosis in 2–8 weeks, or thereabouts. The flush, the sweating, and the nervousness disappear; the basal metabolic rate falls and the plasma cholesterol level rises; the patient's weight increases and his pulse-rate falls. The initial dose required to produce these effects is of the order of 0·6 g. daily during the early weeks, and 0·05 to 0·1 g., or occasionally 0·2 g., daily is necessary to maintain them thereafter. The initial effect is slower in patients who have recently received iodine. Lid-retraction may diminish, but exophthalmos remains, and the goitre changes little in size—in fact, gross overdosage, likely to occur with larger doses in the early weeks, causes a pronounced enlargement of the goitre; chronic slight overdosage makes the patient bloated, weary, and depressed. The minor "toxic" effects, which are the result of idiosyncrasy and appear usually in the second week or later in the initial period of high dosage, are fever, rashes, and enlargement of lymph-glands; but the one to be feared is agranulocytosis.

In May, 1943, ASTWOOD[1] reported the beneficial effects of thiourea and thiouracil given to thyrotoxic patients, and in October of the same year HIMSWORTH[2] published the first confirmatory series of cases in this country. His fuller observations were communicated to the Royal Society of Medicine in June, 1944.[3] These observations have since been abundantly confirmed and slightly extended. The slower response of iodine-treated patients is well established.[4 5 6] Enlargement of the goitre during treatment has often been seen[4 6] but less often recognised as being due to overdosage.[7] Normal rhythm has been restored in cases of thyrotoxic auricular fibrillation.[8] The response is seen in cases of so-called secondary thyrotoxicosis or toxic adenoma as well as in the typical Graves's disease of young subjects,[4 6 8] and it occurs in the presence of diabetes or of pregnancy.[6] Methylthiouracil acts similarly to thiouracil. Of the "toxic" effects of thiouracil, the fever is mild; the rash may be morbilliform and itching, or urticarial[4]; the patients may develop transient anorexia or vomiting, or a curious œdema of the legs.[4 8] Granulocytopenia or agranulocytosis, though most likely to appear, if at all, during the initial weeks of high dosage,[8] has been recorded during maintenance treatment with 0·2 g. daily[4 9]; in 135 cases collected by DUNLOP[10] it occurred six times in all, twice to only a slight degree, twice more severely, once with associated thrombocytopenia and hæmorrhages, and once fatally. A generous allowance of vitamin-B complex, in the form of liver extract, may reduce the danger of agranulocytosis.

So far patients taking thiouracil have been kept well for periods up to 13 months.[10] When the drug is stopped, thyrotoxic manifestations often reappear within a few weeks, but yield to resumed treatment.[4 8] In some cases however they have remained in abeyance for up to 8 months without the drug.[6 8] Where the maintenance dose has been too large, the clinical features and the excessive lowering of the basal metabolic rate show that it has produced mild hypothyroidism,[4] but this is reversible. The evidence is still insufficient to answer the major question whether thiouracil should replace thyroidectomy as the standard treatment for thyrotoxicosis, but the indications are strong that it may do so. Its action is to forestall the final synthesis of thyroxine in the thyroid, which nevertheless continues to present the histological picture of overaction, accompanied by an increased formation of lymphatic tissue.[5 11] It is presumed that the stimulus to this overactivity, whether it be pituitary thyrotropic hormone or some other influence, also continues. But it must be remembered that untreated thyrotoxicosis when not fatal is often a self-limiting disease, ending in a return to a relatively normal state or occasionally in myxœdema. If a return to a relatively normal state of the thyroid proves to be the end-result in most cases whose symptoms are controlled in the interim by thiouracil, the justification for surgery will have gone; the remissions reported after thiouracil encourage this hope. It may even be, as LEYS suggests in this issue, that the untreated disease involves a vicious circle of stimulation of the thyroid by the pituitar and stimulation of the pituitary by the thyrotoxicosi a circle that thiouracil may break, though more slowl than partial thyroidectomy. If permanent hyp thyroidism after thiouracil treatment proves commo thyroidectomy may re-establish itself as the earl treatment of choice; it is yet too soon for this en result to have been observed. The danger of fat agranulocytosis, in patients whose blood-counts ar carefully observed and in whom suspicious earl symptoms can be investigated, already seems les than the operative mortality of thyroidectomy i expert hands.

Meanwhile, some surgeons[5] prefer thiouracil t iodine in preparing the patient for thyroidectomy

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1. Astwood, E. B. *J. Amer. med. Ass.* 1943, **122**, 78.
2. Himsworth, H. P. *Lancet*, 1943, ii, 466.
3. *Proc. R. Soc. Med.* 1944, **37**, 693.
4. Williams, R. H., Clute, H. M. *New Engl. J. Med.* 1944, **230**, 657.
5. Moore, F. D., Sweeny, D. N., Cope, O., Rawson, R. W., Means, J. H. *Ann. Surg.* 1944, **120**, 152.
6. Eaton, J. C. *Lancet*, 1945, i, 171.
7. Donald, J. B., Dunlop, D. M. *Brit. med. J.* 1945, i, 117.
8. McConnell, J. *Amer. J. med. Sci.* 1944, **208**, 561.
9. Linsell, D. *Ibid.* 1944, ii, 597.
10. Dunlop, D. M. *Pharmaceut. J.* 1944, **153**, 246.
11. Clute, H. M., Williams, R. H. *Ann Surg.* 1944, **120**, 504.

because thiouracil can be relied on to get the basal metabolic rate down to normal, and it may be expected, by inhibiting thyroxine formation, to obviate post-thyroidectomy crises due to the liberation at operation of hormone stored in the gland. On the other hand, thiouracil gives the surgeon a thyroid that is more vascular and friable than the iodine-prepared gland. These considerations should be in the minds of both specialists and general practitioners if the use of thiouracil, now likely to become widespread, is to be effective and discriminating.

100%

A PREMONITORY letter sent out by the council of the British Medical Association says that the special representative meeting to be held on May 3–4 ought to reach a firm decision on the question whether the profession will coöperate in developing a comprehensive national medical service available (irrespective of income) to all who want to take advantage of any or all of its proposed benefits. This is the "100%" issue, on which so much else depends, and it is certainly time that it was settled—provided the right answer is reached.

The Government declared in their first pronouncement, during the debate on the Beveridge report, that they wanted and intended the medical service to be for everybody. They reiterated this decision in the white-paper, where they stated that "the proposed service must be 'comprehensive' in two senses—first, that it is available to all people and, second, that it covers all necessary forms of health care." There is nothing to indicate that they have since found cause to depart from this attitude. The medical profession, on the other hand—if we may judge by the answers to last year's questionary and by the decisions of recent representative meetings of the BMA—has been divided in its opinion, without an overwhelming majority one way or the other. Some doctors have taken the line that, as both Parliament and press welcomed the principle of universality in the new service almost without dissent, the profession should accept this as the expressed wish of the country, and should seek to design a universally available service that would function fairly both for patient and doctor. Others feel that parliamentary approval was given without any real understanding of the far-reaching changes implicit in the new scheme, and believe that something less than a service for all is in the best interests of the community. Still more have been unwilling to make up their minds, and as meeting has followed meeting have put off a decision on this subject until more was known of the likely shape, and proposed terms of service, of the new organisation. Whether or not the shape of things to come will appear any clearer to these doubtful ones next May we cannot predict, but it does seem that a statement of opinion can now no longer be delayed. So the alternatives must be discussed, and the arguments for and against a service for all must be heard again.

Those who favour an income limit, above which participation in the scheme should be restricted, base their preference on the premise that true independence of doctor and patient cannot be preserved unless wide scope remains for private practice. It is argued that many who are now private patients—and would prefer to remain private patients—will not be able to afford to do so if they have to pay increased rates and taxes, and high insurance contributions towards the cost of the extended social services now proposed by the Government. It is therefore suggested that people earning more than a given income shall either be precluded from participating in the new service, or alternatively, if they agree not to make use of it, shall contribute to the cost of the service but be allowed a grant towards the cost of medical attention privately obtained. As, however, the Government mean to make the whole community contribute (by rates, taxes, and direct contribution) towards the cost of all social services, and also to make the other benefits of the social insurance scheme available to all, it is hard to see how any income group could be excluded from the right to take advantage of all or any of the medical benefits, if they wished to do so. It is possible to make out a case for allowing people (whatever their income) to renounce their claim to all medical benefits and receive instead a yearly rebate of their insurance contributions as a grant-in-aid towards medical expenses privately incurred. This might well be permitted—although, in setting the level of contributions, actuarial allowance may have already been made for a proportion of the community not claiming benefits, and an all-round increase in contribution would then be necessary if a grant-in-aid allowance were contemplated. But quite another principle would be involved if it were claimed that contributions to rates and taxes should also be returnable, and it is highly improbable that this latter suggestion would ever be entertained. So in practice the grant-in-aid returnable would consist only of that part of the social security stamp representing the contribution of the national insurance fund towards the cost of the medical services. This is hardly likely to amount to more than £2 5*s.* per annum per contributor, and those who chose to receive this grant would presumably have to give up their whole right to participate in any part of the national service, and thus shoulder for themselves and their dependants the potential cost not only of all general-practitioner, specialist, and hospital care they might need, but also the cost of all dental, nursing, midwifery, and other services offered as part of the new national service. Very few people—particularly among those of borderline incomes, whose interests it is claimed most need protection—would find this rebate scheme attractive when their attention was directed to the benefits they were asked to renounce in order to receive so small a grant-in-aid. They would probably regard the sum of money involved as a reasonable premium for insurance against so comprehensive a catalogue of risks.

Hence it seems unlikely that much could be gained, or many people helped, by a struggle (of doubtful outcome) to upset the principle of universality. In such a struggle it would be hard to produce publicly convincing arguments to offset the charge, which is certain to be made, that the profession is seeking to provide a different service for the section of the community that can afford to pay for it. For these if no other reasons we should ourselves approve the basis suggested for the new service in the white-paper: that it "will be there for everyone who wants it—but if anyone prefers not to use it, or likes to make private arrangements outside the service, he must be at liberty to do so." This, as we see it, is at once the most reasonable basis, and the one most likely to be accepted by the public. We trust the Representative Body, after it has heard all the many arguments, will endorse this point of view, and will instruct the BMA nominees on the Negotiating Committee to proceed with negotiations on the 100% basis. Then, as each section of the developing scheme is considered, appropriate advice can be tendered in full realisation of the fact that a service is being planned which must serve and suit all members of the community.

Annotations

PURPOSEFUL PT

FUNDAMENTAL changes have been made in Army physical training methods in this war. The "jerks" of the last war—those haphazard attempts to strengthen muscles generally—are gone, and good riddance to them. In their place are planned purposive exercises intended to make a man quicker and more efficient at his own fighting job, whether this is aiming a rifle, lifting shells, or bridge-building. It is the logical next step, after the psychological selection of a man for a particular job, that he should be fitted for it physically by specific recreation and exercise. A good example is the development of skill and coördination in handling heavy anti-aircraft shells, and the laying down of methods of lifting and carrying whereby these operations, common to many Army employments, can be performed most easily and economically and with the least risk of strain. This is all-important in the heavy work which often has to be done by middle-aged men of low physical category. Exercises are devised in which a shell taking the place of a medicine-ball is lifted and held in various positions, or transferred from arm to arm. These weights are lifted from the ground with the back straight and knees bent, avoiding the heavy strain on the flexed lumbar spine which is a prime cause of prolapse of intervertebral discs. In the same way, a detailed analysis and study of the strenuous work of manhandling guns over difficult ground provides the basis of special drill. Just as a particular industrial activity can be broken down into its components, awkward and unnecessary ones eliminated, and a simpler economic synthesis developed, so the right way to dig or to use a pickaxe can be taught; and, more important, recruits can be made to walk correctly before marching long distances.

Progressive training in this way develops specific muscle groups and leads the man to assimilate the necessary rhythms as a subconscious routine. The progressions in power and range are essentially the same as those E. A. Nicoll adopts in the reablement of Nottinghamshire miners, but in soldiers they are specifically applied from the outset. Rifle-training develops shoulder, arm, and hand muscles. It teaches dexterity in handling and swinging the rifle, reversing grip, and passing it from hand to hand; and the control of aiming and twisting movements in different positions of standing, kneeling, and lying. The soldier thus anticipates the movements he will need in battle, acquiring a reflex and automatic dexterity which will stand him in far better stead than the old-fashioned training in marksmanship only. The specific training of the parachutist in landing and jumping forms an obvious prototype of the new methods. In the general, physical training scheme *some substandard men need a preliminary conditioning course*, and many have to be taught proper posture and carriage. The main programme includes [illegible] only the purely physical side and the acquisition [illegible] omatic routine by repeated effort, but getting the soldier to realise the use of it all in his later fighting life. The exercises themselves aim at progression in mobility, strength, and endurance, leaving speed and dexterity until later; progress must be regular and steady, for failure and disappointment follow if exertion is called for of which a man is not yet capable. Economy and rhythm in the use of energy are taught—the maximum local concentration of force in particular actions, avoiding wasteful general tension. All this, of course, makes special demands on the instructor. He must arouse interest by constantly imagining himself in the place of his class, must watch for signs of failure to understand, and never over-persevere at one thing. And he must be positive, preferring do to don't, and must be able to communicate his own enthusiasm, have a pleasant address, explain clearly, and pay attention to the backward boys. All this seems to call for a veritable paragon, but the APTC sergeant rarely falls short in these qualities.

WOMEN, SICKNESS, AND FATIGUE

STUDIES of the health of women have a special interest in relation to the falling birth-rate. Wyatt[1] has published a survey of certified sickness absence among a representative sample of some 20,000 women employed in varied types of work in different parts of the country. Taking into account days of certified sickness, days of uncertified sickness, and discharges of workers through ill health, the total time lost through sickness was probably about 10% of the working time. In every age-group, from 15 to 60, the married women had more sickness and were more prone to accidents, whether in the factory or at home, than the single women. They had 48% more certified sickness absences and lost 65% more time. But this is not news; it was familiar before the war. Sir William Beveridge[2] says:

> "As regards sickness, experience has shown that at all ages up to retirement claims for sickness benefit among married women are higher than among single women."

Wyatt suggests that the strains, stresses, and fatigue of war conditions, the breaking up of homes by evacuation, and the absence of husbands are largely responsible for the greater liability of wives to fall sick; but if married women are always more liable to sickness, war or no war, then some common factor must be affecting their health. This factor, Wyatt shows clearly, is fatigue. The sickness absences of the production and examining groups (workers on their feet most of the time) are nearly *three times as great* as those for the clerical group. Among this last group "there was less boredom, fatigue, and strain," and much less difference in sickness-rates between married and single workers. The most prevalent types of sickness were respiratory (mainly colds and influenza), but there was also an unduly high proportion—by peace-time standards—of "functional nervous disorders and general debility." Digestive, circulatory, and locomotor diseases were also common. Such disorders can be prevented or greatly alleviated by adequate rest; even the incidence and severity of colds and influenza can be lessened by care taken at the beginning of an attack. In some factories clerical workers are allowed an extra four days' sick-leave at the beginning of a cold.

Hungry or ill-nourished people tire more quickly; and Wyatt comments on the indifference of many women workers to a properly balanced diet. The busy housewife, always on her feet, troubles little about her own food so long as her family is fed, and often gives the children part of the rations she needs herself. The daily routine at home is tiring, but when the load is increased by a day's work at a factory coupled with inadequate

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1. Wyatt, S. *Spec. Rep. Ser. med. Res. Coun., Lond.* 1945, No. 86 Pp. 34. 9*d.*
2. Beveridge, W. Social Insurance and Allied Services, 1944. Cmd. 6404, Para. 114.

meals, the woman's resistance to disease is gradually broken down. Most of the women who throng outpatient departments and crowd the doctor's evening surgery need a rest. Some of the enlightened factories give frequent spells of leave with benefit, and there is at least one factory which runs a holiday hostel. Some provision too is needed for women, other than factory workers, who combine war work with running a home, and for those mothers of young children who have no help and no time off in the 24 hours. Women of all classes complain of fatigue. Many of those who used to keep maids now do all their own cooking and housework and queueing; when they fall ill, even with colds, they take longer to recover than they used to do. In general, factory workers in the older age-groups and with the longest times of service take longer sickness absences, but Wyatt found that the married women between 20 and 30 had the highest rate of sickness absence. But marriage, he notes, has a toughening effect in some ways; the older married women are better able to stand up to the foremen and to win small amenities, such as permission to brew a cup of tea or to sit on a box. The authors of *The Peckham Experiment*[3] found only 9·2% of the people they examined free from defects or deficiencies, and Prof. Macneile Dixon[4] says:

> [illegible] Out of 20 million school- [illegible] lion were, after examina- [illegible] ne defect. The proportion is high, and would probably be higher . . . were the whole world made the basis of a survey."

A witness to the Royal Commission on Population is said to have remarked that women intended to have more pleasure and leisure; and that with the aid of the tin-opener and the contraceptive they looked like getting them. Perhaps by taking thought the community can gratify their very moderate desires in ways which are less destructive biologically.

ECOLOGY OF MENTAL DISEASE

SURPRISINGLY few studies have been made to determine the incidence of diseases in persons belonging to communities of different social and economic structure. Such investigations as those of Titmuss and Morris on the epidemiology of juvenile rheumatism[5] and peptic ulcer[6] show how illuminating the findings can be even when the data about social background are necessarily crude. Some of the most valuable and detailed work of this sort has been carried out in the psychiatric field. The notable study of Faris and Dunham[7] in Chicago threw light on the differential incidence of mental disorder in urban areas; Neustatter's inquiry[8] in a London district yielded unexpected figures about the comparative frequency of neurotic symptoms among the children of the poor and of the well-to-do. A recent investigation in the United States[9] has made use of the opportunities afforded by the war for the medical examination of a cross-section of the younger male adult population. Hyde, who had published a community study[10] of pulmonary tuberculosis in men examined at the induction stations for the Armed Forces in the United States, has extended his inquiry to psychiatric illness.

He points out that earlier studies on the prevalence of psychiatric illness had largely been based on rates of admission to mental hospitals, and were therefore subject to a selective factor dependent on the attitude of the community towards mental hospital care. By examining recruits this bias is avoided; a good sample of the normal male population within specified age-groups is obtained. He analysed the data about 60,000 "selectees" from the Eastern segment of Massachusetts—i.e., an area within 35 miles of the coast. Of these, 10·8% were rejected for psychiatric reasons. With the help of Kingsley he classified the communities from which they came in terms of their socioeconomic level or desirability, the criteria of this being the quality of medical care, education, recreational facilities, public works, housing, and welfare. Six classes were thus derived, ranging from the worst slums in Boston to suburban residential areas with many amenities. Among all candidates examined, the percentage rejected on psychiatric grounds increased steadily as one passed from the best to the worst communities classified in the way described. It is clear that people with special physical and mental handicaps would gravitate into poor communities or fail to rise from them, but this would not account wholly for the concentration of psychiatric disabilities in the poorer areas. Hyde and Kingsley examined the incidence of individual psychiatric conditions causing rejection. They found that mental-deficiency rates showed a steady increase in inverse relation to the social level of the community. In the case of chronic alcoholism the percentage rejected in the more desirable communities was roughly constant, but it was appreciably higher in the least desirable community. Psychoneurosis was not more frequent in relation to the social level, whereas psychopathic personality led to the rejection of only 2·3% of those coming from the most desirable communities but caused the rejection of 6·9% of those coming from the lowest economic and social levels. As Hyde and Kingsley point out, cause and effect are here difficult to separate; the psychopath tends to gravitate into the undesirable community, and the undesirable community tends to provoke psychopathic reactions. Moreover when poverty is extreme it tends to provoke excessive anger and acquisitiveness. Psychoses, it was found, were more frequent in the poorer communities.

The variations which Hyde and Kingsley report in the relation between the socioeconomic level of a community and the incidence of particular mental disorders among its members are not surprising, but the possible causes will need much further study before they can be taken as certain. When, for instance, the differences between incidence of psychoneurosis and of psychopathic personality are explained, as by Hyde and Kingsley, on the ground that the members of most desirable communities are restrained by social custom from the forms of aggressive behaviour frequently exhibited by the psychopath, and consequently frustration and other stress lead in such communities to nervous indigestion, headaches, and anxiety rather than to drinking, fighting, and stealing, it is evident that here is a hypothesis which calls for fuller investigation.

Although it is probable that the more unfit tend to drift into the poorer communities and that differences in cultural acceptability determine whether conduct is antisocial or not in communities with different social and economic standards, it might also be assumed that the more crowded an area, on the whole, the higher the probability that mental disorder would occur in it: broad differences such as have been demonstrated in earlier studies between urban and rural communities might thus be in part accounted for. Dayton,[11] for instance, found that although 7·6% of the population of Massachusetts lived under rural conditions, only 3·9% of first admissions to mental hospitals were from rural districts, and they were largely for disorders associated with physical disease such as senile psychoses, arteriosclerosis, or mental deficiency. Shaw[12] found that delinquency-rates similarly diminished rapidly from the densely populated centre of Chicago towards the less crowded periphery: in Boston there were comparable findings.[13] Hyde and Kingsley therefore re-analysed their data, classifying the men not according to social and economic levels, but according to the density of population in the areas they came from.[14] It emerged that the highest rate of mental disorder causing rejection occurred at the two ends of the scale; the rejection-rate was 12·1% for communities with less than 500 people to the square mile, and 14% for communities with 20,000 to the square mile; communities of intermediate density had a rejection-rate of 8 or 9% The very thinly populated areas, it was found, were isolated and degenerate rural communities; none of the 13 communities which had extremely low rejection-rates for psychiatric disorder had either an extremely high or extremely low density of population. Mental deficiency and psychoneurosis had their highest rate in the semi-rural areas and their lowest in the small cities. For chronic alcoholism and psychopathic personality the highest rate was in a large city; the lowest rate was in the semi-rural communities, and in the small cities. Of all the conditions studied it was only chronic alcoholism that was related to population density throughout its complete range; evidently alcoholism is more closely connected with overcrowding than with social and economic level.

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[3] [illegible]
[4] [illegible]
[5] [illegible]
[6] [illegible]
[7] [illegible]
[8] [illegible]
[9] [illegible] 513.
[10] Hyde, R. W., Zacks, D. *Ibid*, 1943, 229, 511.
[11] Dayton, N. New Facts on Mental Disorder, Springfield, Illinois, 1940, p. 382.

The explanation of these findings, which Hyde and Kingsley discuss, points to the need for comparable and more detailed studies in other communities. There are many besides the psychiatrist who need to know to what extent social causes are responsible for mental disability and how far bad social conditions are measures of the collective mental disability of the individuals making up the community.

OCULAR COMPLICATIONS OF INFLUENZA

EYE complications arise in about 10% of influenzal patients, the commonest sequelæ being herpetic corneal ulcer, iritis, and metastatic panophthalmitis. Herpetic ulcer of the cornea may arise after high pyrexia from whatever cause, but especially after pneumonia, malaria, and influenza, and herpes labialis, due to the same cause, may be found in the same patient. These ulcers are sometimes very slow in healing, and before they will do so it is usually necessary to paint them with a strong antiseptic, the most popular for the purpose being carbolic acid (pure), strong tincture of iodine, or silver nitrate 2%. Postinfluenzal iritis is usually a mild form, and if treated early with atropine before adhesions can form between the iris and lens the condition has normally cleared in 3 weeks; but atropine should be continued for at least a week after the eye is white. Metastatic panophthalmitis is a disaster and spells the doom of the eye: no treatment is likely to be of any avail, though penicillin and sulphonamides may be given a trial. Rycroft's[15] recent experiments seem to show that penicillin does not enter the vitreous chamber in sufficient quantity to be of any therapeutic value, but until this fact is confirmed it would be unwise to withhold from the patient the only treatment that is in the least likely to benefit him at all. Eyes so affected are painless and show little if any external inflammation. A soft and sightless eye with a dull yellow reflex behind the lens is the only physical sign, and no immediate surgical interference is required. There is not the least danger of the infection spreading to the other eye and the globe may well shrink until it becomes a small fibrous nodule lying at the back of the socket, over which a glass eye can easily be fitted. The ocular remains should only be removed if they become irritable.

REGENERATION OF THE SCROTUM

EXAMPLES of regeneration of the scrotum recorded previously and by Mair in our present issue are a reminder of Nature as teacher. The usual cause of destruction of the scrotum is bacterial infection. Provided the infection does not spread or kill the patient from toxæmia the local condition may be restored in about 70% of cases and in a very short time. It is tempting to suppose that this regeneration with complete restoration to normal is due to special regenerative power or embryonic potentiality in perineal skin. Once the scrotal sloughs had separated, leaving a fringe of healthy perineal skin, Mair describes the covering of the bare dependent testicles in 7 days with rich granulations. Meanwhile epithelium was growing from the severed edge at a slower pace but had almost completely covered the granulations in 28 days. Normal epithelial regeneration is always an astonishingly rapid event, but whether more rapid in the scrotum than elsewhere it is impossible to judge without accurate measurements of the rate of covering of comparable areas. This could of course be done. Provided epithelium has a normal bed on which to migrate and multiply it is even difficult to hold it back, as has been found in the rabbit ear using the Sandison-Clarke technique to observe granulation tissue where an epithelial covering is not wanted. What is so remarkable in the scrotum is the rapidity of formation of the bed of granulations. From exactly what vascular sources did they spring—perineal, or spermatic, or both? Is the endothelium of the tunica vaginalis vasoformative when uncovered, or does it supply some stimulus for vascular and lymphatic growth from elsewhere? Is a long-sought growth hormone to be found in these tissues? As we have suggested before,[1] the connective tissue foundation is important in healing, and here in the scrotum is one which appears to be so unusually favourable as to deserve further study.

Surgeon Rear-Admiral G. GORDON-TAYLOR will deliver the Vicary lecture at the Royal College of Surgeons of England on Monday, April 16, at 4 PM. He is to speak on the medical and surgical aspects of the Jacobite rising of 1745.

THE INDEX and title-page to Vol. II. 1944, which was completed with THE LANCET of Dec. 30, is published with this issue. A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, WC2. Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now.

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[12] Shaw, C. R. et al. Delinquency Areas, Chicago, 1929, p. 202.

[13] Boston Council of Social Agencies. Social Statistics Census Tracts in Boston. Vol. II. Boston, 1935, pp. 14–18.

de, R. W., Kingsley, L. V. *New Engl. J. Med.* 1944, 231, 571.

roft, B. W. *Brit. J. Ophth.* 1945, 29, 57.

[1] *Lancet*, 1944, i, 314.

IN TWO WARS.—On Mondays and Wednesdays, April 30, May 2, 7, 9, 14, and 16, at 4 PM at the London School of Hygiene, Keppel Street, WC1, Prof. M. Greenwood, FRS, will give six public lectures on medical and social comparisons between the conditions of England in the wars against Bonaparte and Hitler.

LONGER MEDICAL CURRICULUM IN USSR.—The *Soviet Medical Chronicle* for March says that the course of study at all medical schools in the Soviet Union is to be lengthened from five years to six. Transition to the new system, which will take three or four years, will begin with the next academic year. More time is to be given to anatomy, physiology, biochemistry, clinical medicine and surgery, pædiatrics, and gynæcology. Committees are engaged on revising the curricula, and steps have been taken to increase the publication of textbooks. Next year 26 books are to be issued, in editions ranging from 10,000 to 25,000.

Special Articles

DISPLACED PERSONS: THE MEDICAL PROBLEMS

R. L. Coigny, M.D. Paris

HEAD OF THE SECTION OF MEDICAL SERVICES FOR DISPLACED PERSONS, HEALTH DIVISION, EUROPEAN REGIONAL OFFICE, UNRRA

It is estimated that in Europe alone, about 21 million persons, including prisoners of war, forced labourers, and political or racial deportees, have been removed from their homeland (fig. 1). Among them are about 20% of women, and in the Western part of Germany alone, among 9 million displaced persons, 250,000 children are estimated to have been born.

This unprecedented migration will cause an enormous problem when the time comes for repatriation. Large numbers of people will doubtless endeavour to make their way home unaided, and the countries through which they pass will be affected by the spread of diseases and by pillage. This mass movement cannot be left unorganised.

CONTROL OF EPIDEMICS

Unrra, collaborating with the Allied military authorities, will be the international civilian organisation representing the countries concerned, to secure the necessary coordination and draw upon adequate resources. The [illegible] the military draw out.

Medical questions are closely linked with the whole of this enormous and complex problem of housing, clothing, transport, food, welfare, and entertainment. A Multilateral Agreement is being signed by all the governments concerned, recognising the health organisation of Unrra as constituting an emergency international health service for displaced persons, and this will grant to the medical and technical personnel of Unrra such rights and privileges within their respective territories as may be necessary to enable them to carry out their duties. The danger of spreading epidemics, affecting not only the civilian populations but also the Armed Forces, is the most serious aspect of the medical problem.

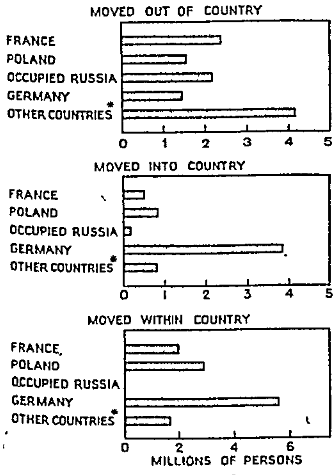

Fig 1—Displaced persons in Europe

* Other countries include Belgium, Netherlands, the Scandinavian countries, the Balkans, Czechoslovakia, Hungary, and Italy.

Before the war, typhus fever was endemic in Russia, Rumania, Bulgaria, Yugoslavia, and Poland. Since 1940, the immense traffic from East to West has resulted in the expansion of the typhus area, and cases are on the increase in Hungary, Austria, and Germany (fig. 2). An epidemic occurred in Turkey in 1943, and in Naples and Croatia in 1944. Fortunately the U.S.A. Typhus Commission has developed control measures against typhus, by the new and rapid method of disinfestation by DDT (dichlor-diphenyl-trichlorethane) powder, and by the immunisation of all personnel working in a typhus area and all displaced persons coming from or travelling to an epidemic area. The rapid extinction of the Naples epidemic has been a great encouragement for the future of these methods.

Malaria is widespread in the Balkans and Eastern Poland. In Rumania, 250,000 new cases have been reported every year since the beginning of the war; in Greece, 30% of the population is infected; in Holland, too, the disease is increasing, and owing to the recent floodings, pre-war control measures against mosquitoes have been seriously disrupted. Mepacrine has however proved a successful substitute for quinine, giving as good results, and being available in larger quantities.

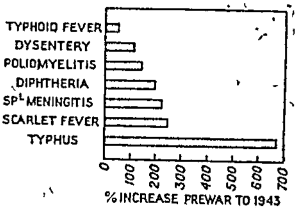

Fig. 2—Increase of disease in Europe.

Numerous cases of smallpox and plague have been reported in the Middle East.

CENTRES FOR SUPERVISION

The doctors and hygiene experts in charge of displaced persons will be responsible for the supervision of camp sanitation, in particular the water-supply, latrines, and kitchens, and it is therefore hoped that by improved sanitary conditions they will be able to keep typhoid, dysentery, and cholera in check.

Assembly centres have been planned to receive displaced persons. People trekking homeward will be directed to these centres where they will be deloused, housed, fed, and clothed while awaiting organised repatriation. These centres will hold a maximum of 10,000 persons. Teams comprising 12 people, and including a doctor and a nurse, are being recruited and trained both in this country and on the Continent, and one team will be allotted to each centre. Assembly centres will be grouped into regions, and a medical staff, including specialists, will be established at each of these regional headquarters.

On arrival at an assembly centre—after delousing—the displaced persons will undergo a medical inspection, and those suffering from contagious diseases will be isolated. The sick and injured, and pregnant women nearing confinement will be sent to hospital. A card system has been evolved to check the identity, nationality, and health of each displaced person, and a medical clearance certificate will be issued to each before repatriation is allowed.

Persons too weak to travel by normal channels, and all chronic cases, will not be held indefinitely in centres but will be repatriated in ambulance trains under the supervision of a medical staff.

The military and Unrra have planned to provide a daily ration in assembly centres which will not be less than 2000 calories a head and which they hope to be in a position to raise to 2650 calories. Special diets and extra milk will, of course, be needed for the sick and for children under 5 years of age; also additional rations for pregnant women.

The welfare officers will have a great responsibility in providing comfort and entertainment, especially for the women and children; but in nearly every instance the welfare and the medical services will be interlocked, and will work in close coöperation, since during such a tragic period these people will have suffered as much mentally as physically. It will be easy to diagnose mental cases needing medical supervision, but there will doubtless also be large numbers of people mentally disturbed to some extent who—though they may not require hospital treatment—will need to be handled with great care and understanding.

Thi[illegible] erned solely [illegible] sting effects [illegible] and in meeting the medical problems of each country. This applies particularly to tuberculosis and venereal diseases.

It will be impossible to treat, or even to diagnose all the cases of tuberculosis without delaying the repatriation of large numbers of people. A number of teams, however, specially equipped with mobile mass radiography units, will be sent to Germany by UNRRA, to examine a proportion of displaced persons of each nationality, with the purpose of making figures available on a percentage basis to each country to enable them to judge the extent of the problem they will be called upon to face. As the number of beds for tuberculosis is inadequate in nearly every European country and since a high percentage of cases are likely to be encountered, the countries concerned should begin to formulate their plans immediately if they wish to succeed in an antituberculosis campaign.

The problem of venereal diseases is slightly different. New methods of treatment will enable us to deal quickly with all contagious cases, and if penicillin is available from the military for displaced persons, the task will be greatly simplified and no delay of any importance need occur in repatriation.

FUTURE OUTLOOK

These collective measures cannot be undertaken by any international organisation without the agreement of the governments concerned, and can then only be successful if medical supervision is resumed after arrival in the home country. These are matters of long-term policy and it is important that they should be worked out satisfactorily. One of the main difficulties is the shortage of medical staff. Apart from UNRRA personnel, there will be medical officers from the occupying forces, doctors who were held prisoners-of-war, and those displaced to look after forced labourers. To make the scheme a success all these must work together.

Had Germany collapsed rapidly, a certain amount of medical supplies would probably have been found; but it is estimated that bombing and widespread destruction have lowered the German production of these supplies to 25% of its pre-war figure, and a large quantity of medical supplies will have to be imported for the care of displaced persons.

After repatriation of the bulk of the displaced persons, a considerable number of Stateless people will remain scattered over Europe, and it is here that UNRRA will have to apply long-term health measures until countries can be found willing to absorb them.

It is difficult in an article to describe all the problems that will arise and to give to each its right proportion. It is hoped however that the magnitude of the task facing us will be understood, as well as the difficulties arising from the conflict between the natural desire of the displaced persons to return as quickly as possible to their homes, and the urgent need for health control measures in order to avoid chaos and an extensive post-war European health problem.

A SCHOOL FOR TROUBLED CHILDREN

THOSE running child-guidance centres must often wish they had a school in league with them to provide the right atmosphere for maladjusted children. For five years Chesterfield, a Midland town of 65,000 inhabitants, has had a children's centre working with an open-air school for children who are physically or emotionally handicapped, and a report [1] on the experiment has now appeared.

A large house on the outskirts of the town, with 15 acres of grounds, was acquired. The school buildings, which will take 125 children, were built in the grounds, with classrooms of the open-air type. In 1941 these chosen surroundings were taken over for an auxiliary hospital by the Minister of Health, and since then the school and centre have continued their work in somewhat cramped but suitably adapted quarters elsewhere. Brambling House was a day school at first, but a residential hostel, Holly House, was added in 1943, and can take 18 children.

Since the process of growth in childhood is at once physical, intellectual, and psychological, the school tries to serve all three aspects. Thanks to this triple approach it has been possible to ignore the distinctions usually made between the delinquent, the nervous, the retarded, and the ill child, and to receive those suffering from such varied conditions as chronic headache, stealing, rheumatic pains, temper tantrums, bed-wetting, shyness, asthma, lassitude, nervousness, and school failure. Most of those admitted are physically defective, but there are also anxious and over-shy children, aggressive children, sullen and defiant children, delinquents, and retarded children. It is found that the aggressive, noisy, misbehaving type can only be made to fit into the friendly school atmosphere if they are limited to about 3 in a class of 25. A small number of children get all their schooling at Brambling House, but most of the pupils come only for a time, leaving as soon as they are fit to go back to ordinary school life. While at Brambling, they work and play in the fresh air, get a nourishing diet, a rest of 1½ hours in the open air daily, and regular physical exercise: they are taught biology and practical health principles as part of their lessons. Epidemics have been few, and most of the children have shown a rewarding gain in health and brightness. The school is planned to help them to live happily together, to join in community life and to take personal responsibility.

The children's centre is staffed with psychiatrists, a psychotherapist, an educational psychologist, and a secretary. It is primarily intended for children from the Chesterfield elementary schools, but children from outside the borough are accepted on payment of a fee. Of 347 cases referred to the centre 85 also attended the school: 37 of these became fully adjusted, and 16 improved; 7 showed no change, but one of these was epileptic, another mentally defective, and a third postencephalitic; 7 had uncooperative parents; 11 are still under treatment; the remaining 7 were removed or relapsed. Uncoöperative parents, it seems, fall into two classes—those who neglect their children, and those who indulge them too freely, wishing them to remain dependent.

The hostel is managed with the help of two assistants by a sympathetic warden and house mother, who are husband and wife. The children join in local activities such as the cubs, and parents are encouraged to visit, and to have children home for holidays. Besides taking children attending the school or centre, Holly House has also received children entrusted to the local authority while foster-homes are being found for them. Case-histories at the end of the report illustrate the good results claimed; indeed, release from a burden of chronic ill-health and anxiety converted two relatively meek children into rather bossy ones, and treatment had to be continued until they had acquired a steady poise.

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on a five-year experiment in the combination of open-air al and psychotherapeutic treatment in a Midland town. terfield Education Committee.

In England Now

A Running Commentary by Peripatetic Correspondents

ON the morning of March 24 I was convalescing languidly in company with the hospital crocus, and musing on the degree of its very apparent anæmia, when I heard a hum. Looking to the west I was astonished to see the sky black with aircraft. First came a wave of unattached bombers, and then Dakotas—hundreds of them—each towing a glider. The noise of this Armada was only just abating when, after a decent interval, another fleet of yet bigger and better bombers arrived, presumably carrying the heavy equipment and guns. All this occupied about an hour and a half, and proved such a salutary tonic that I promptly discharged myself from hospital, and arrived back on duty next day in time to help receive our first convoy from the Rhine. This consisted of men wounded during the crossing and in the first few hours on the eastern bank. The medical contingent amounted to three patients all suffering with acute fibrositis precipitated by an involuntary river bathe *en route*.

We were all naturally anxious to know how things were going when they left, so, largely at the request of our ex-Maquis Belgian stretcher-bearers, I went round to interrogate a number of the men on their experiences. I don't know how newspaper correspondents manage to extract the dramatic stories which they print, for not one of these men could produce anything more descriptive than "a bit tough at times," or "lost my bloody kit when we hit a . . . . mine or sommat." I did discover though that the Commandos were angry that official war correspondents were representing the affair as a walk-over: whereas it seems to have been an extremely tough affair once the bank was reached. Their wounds certainly confirmed this version.

Later 240 wounded Huns arrived with a small and extremely C3-looking party of armed Pioneers in attendance. They were a dirtier and more subdued collection than any I had previously met—except for a small bunch of officers, who on seeing me sent an English-speaking private across to say that they expected privileges on account of their rank, and what did I propose? This annoyed me, and I informed them that all I proposed was that they should be specially carefully deloused, a process to which the whole party was then subjected. I was later asked to see a private aged 49 with a flesh wound of the thigh. He told me that this had been inflicted by his officer when he surrendered, which he did because he was having acute pain from an active gastric ulcer, which had rendered him immune from military service until 8 weeks before. Next to him was a youth who said that he was 14. The Polish "volunteer" in the next bed told me however that he was playing for sympathy, and was really 15.

Next day we passed them on to a special prisoners-of-war hospital. After a night's rest and good food there were already signs that the spirit of the *Herrenvolk* was emerging again, and we were not sorry to see them go. They all spoke of "the next war." and not in the conditional tense.

* * *

Fancy your not knowing about our Scottish "wynds." A wynd is a narrow street or passage turning off from a main thoroughfare, a lane or alley. Murray's Scots dictionary suggests that the derivation is from the Old English *gewind*, "winding ascent and spiral." Certainly many of them do wind uphill, and nearly all the old Scottish towns (and ? some in the North of England) have them. The wynds had their special significance in other days. In Edinburgh, for instance, the top of the narrow St. Mary's Wynd was thought to offer a likely access for Jacobite penetration into the Castle. But whatever their romantic claim, the wynds were certainly no asset to the sanitarian. Dr Sutherland, in a report to the General Board of Health on the Glasgow cholera epidemic of 1848–49, wrote:

> It is in those frightful abodes of human wretchedness which lie along [illegible] and constitute [illegible] "Wynds and [illegible] exist in perfection. They consist of ranges of narrow closes, only some 4 or 5 ft. in width, and of great length. The houses are so lofty that the direct light of the sky never reaches a large proportion of them . . . There are large square midden-sheds, some of them actually under the houses, and all of them in the immediate vicinity of the windows and doors of human dwellings

I could find you lots more similar references to the niquities of the wynds, but this will be enough to stop you thinking they are a kind of local *mistral*, though you are right in making them rhyme with tinned.

* * *

They grow fine lettuces round Bagdad—tall and crisp and succulent. About January you begin to see bundles packed tight on trays on the heads of ragged Arabs in the streets. Little boys munch them on the pavements. Before being sold they are always well washed, either in the brown turbid Tigris or more often in the muddy ditches filled with water that run along the streets and arry away the sewage and refuse. Soon after the lettuce comes the typhoid. Not as a rule a long illness, and with a mortality of perhaps one in a hundred or less. Most of the cases are unrecognised and undiagnosed, and only a few patients ever go to bed. Europeans go down too, though again they often have a short but violent illness and fairly soon recover. Relapse attacks seem especially frequent, and rashes are profuse.

* * *

The day was an exceptionally busy one, and the telephone rang for the fifth time in as many minutes. This time it was Mrs. Z, who wished to speak to me and none other. I knew her to be an eccentric old lady of rude manners and equally rude health, so I sighed. "My fishmonger tells me," said she, "that all the poultry goes to the hospitals, so their patients must get plenty. This means I can't get a chicken when I want one. As your hospital is getting all the chickens, please order an extra one for me tomorrow and send it round to my house. Of course, I'll pay for it." Before I could reply she continued. "And there is another matter. My chemist tells me that all the rubber hot-water bottles are sent to the hospitals. So would you send me one from your store?" The position is that we do get six rubber water bottles a year, but poultry of no kind has found its way through the maze of (black) marketing to bring sustenance and a change of diet to any of our patients for more than a year, though you can eat chicken in many a restaurant. A brief explanation to the lady that if I were to assist her with food and warmth in this manner it might land me in prison moved her only to the indignant response that she would never have suggested what she had if it was in any way illegal.

* * *

In common with many others, I was somewhat horrified by the "gaiety" of Cairo when I arrived there in 1942. Rommel was only 70 miles away, and the military situation everywhere could hardly have looked blacker. Reading *War and Peace* recently however I found that Tolstoi knew all about this sort of thing:

> "With the enemies' approach to Moscow the Muscovites' view of their situation did not grow more serious, but on the contrary became even more frivolous, as always happens with people who see a great danger approaching. At the approach of danger there are always two voices which speak with equal power in the human soul: one very reasonably tells a man to consider the nature of the danger and the means of escaping it; the other still more reasonably says that it is [illegible] since it is [illegible] events; [illegible] ful till it comes, and to think about what is pleasant. In solitude a man generally listens to the first voice, but in society to the second. So it was now with the inhabitants of Moscow. It was long since the people had been as gay in Moscow as that year . . ."

For Moscow read Cairo, and there you have it! I wonder how things are in Berlin.

* * *

The activities of Indian tradesmen are a little-known illustration of how the law of mass action works in the sphere of [illegible] articles a [illegible] parts, in [illegible] while the katabolic process is comparatively slow, so that there is very little in the way of an upper limit to the accumulation of the various appliances with which our civilisation has surrounded us. In India, however, the tendency for local fabrications to fall to pieces is pronounced, and at the same time the processes of repair or manufacture are much slower. This leads to an equilibrium state in which completed and functioning articles [illegible] If these all worked, they would represent a real challenge to the insanitation too characteristic of our Indian empire; but in point of fact one is permanently "out of order," [illegible] between complete[illegible] of the completely [illegible], because the ener[illegible] supplies them are already completely occupied in repairing those which they have already made. So the honourable brotherhood of perennial and hereditary wet sweepers need have no fears for their immediate future.

* * *

The case of the missionary who was saved by remarking that the cannibal chief was also wearing a Balliol tie should not be regarded as a precedent by the new Japanese prime minister, who is rumoured to be an old Thomas's man. There has been an unfortunate decline in the old-school-tie spirit at St. Thomas's since he was a student.

* * *

Talk of the complete lead-swinger reminds me how, some years ago, I tactfully told my students that I thought the patient then before us was an excellent example of "oscillatory plumbism." Little did I think that he would absorb the words and subsequently refer to his disease with pride to all and sundry!

Letters to the Editor

PENICILLIN IN SEROUS CAVITIES

SIR,—The serous and synovial membranes form less complete barriers to the passage of penicillin than statements published in your journal (and others) would indicate. The evidence on which this assertion is based has been provided by several observers working in this theatre and has already been placed on record in various reports submitted through official channels. These have only a restricted circulation, but in due course the evidence will be published in a form available for general circulation. The publication of this note, however, may prevent the repetition of statements such as those in your leader of Feb. 10 on Intraperitoneal Chemotherapy.

BLA. G. A. G. MITCHELL.

⁂ Lieut.-Colonel Mitchell, writing on March 26, had not read our annotation of April 7 (p. 439) in which recent work on the passage of penicillin into serous cavities was reviewed.—ED. L.

PENICILLIN IN ACUTE NEPHRITIS

SIR,—Reports on two cases of acute nephritis successfully treated with penicillin appeared in THE LANCET at the end of 1944 (Moncrieff, Shore). Three similar cases have been treated in St. Charles' Hospital.

CASE 1.—Married woman, aged 25. Onset of illness end of December, 1944: acute tonsillitis and left otitis media. Admitted Jan. 23, 1945. Temp. 99·6° F. Pale, puffy face, especially under eyes. Swollen ankles. Heart and lungs normal. BP 150/90 mm. Hg. Urine contained blood and albumin; reaction acid; sp. gr. 1014.

Jan. 24: bilateral myringotomy; right ear discharging blood-stained pus. The ear condition cleared up in a few days without further treatment.

Fluid and food intake were restricted for first 6 days. Penicillin was begun on Jan. 28. The British-made sodium salt was used. Administered by three-hourly intramuscular injections. First dose 45,000 units. Subsequent doses 15,000 units. Course completed in 72 hours. Total amount given 390,000 units.

On the third day after completion of penicillin administration the urine was normal. This was verified microscopically. Œdema absent. Urinary output satisfactory. Free fluid intake and generous diet could be permitted two days later.

The patient left hospital on Feb. 19 in a very fit condition; blood-urea 35 mg. per 100 ml.

CASE 2.—Married woman, aged 43. Had an acute tonsillitis and right peritonsillar abscess at the beginning of January, 1945. About a fortnight afterwards (Jan. 16) signs of acute hæmorrhagic nephritis appeared: puffiness of face, œdema of ankles, raised systolic blood-pressure (175 mm.), hæmaturia with albuminuria. Patient came to hospital on Jan. 24. Temperature was not raised. Hæmaturia was severe. Urine contained granular and hyaline casts.

Dietetic restriction as in case 1. Penicillin administered in the same way and the same dosage as in case 1. Course completed in 72 hours. Total amount given 390,000 units.

On the 10th day after completing penicillin treatment the urine became completely clear, free of blood and albumin; no œdema could be seen; apyrexial; BP 150/70 mm. Hg.

Patient was discharged on Feb. 23; blood-urea 37 mg. per 100 ml.

CASE 3.—Girl, aged 18. Reported ill on Jan. 19, 1945. Right otitis media of 24 hours' duration; ear discharging profusely. Tender over right mastoid process. Complained of pain in loins. Heavy hæmaturia. Temp. 101° F. BP 135/75 mm. Hg. Very slight œdema of ankles and feet. Pus from ear grew hæmolytic streptococcus and *Staphylococcus albus*, both penicillin-sensitive in vitro.

Dietetic restriction as in case 1, including 24 hours' fasting regimen. Penicillin administered three-hourly, as in cases 1 and 2, but in view of ear and mastoid infections it was given for 10 days. Total amount given 1,230,000 units.

Urine cleared three days after completing penicillin injections. Temperature became normal on 7th day after starting treatment. No abnormal signs relating to kidney function could be found. Cultures from pus from right ear sterile during penicillin administration; ear dis- ically ceased a few days after starting treatment. Mastoid had to be drained on Feb. 12—a fortnight after penicillin had been discontinued. Satisfactory healing followed.

The accepted treatment of acute nephritis following or complicating focal sepsis is wholly symptomatic and dietetic, the physician trying to ensure physiological rest for the kidney. Focal infection is dealt with, where indicated and practicable. The sulphonamide drugs are contra-indicated. Penicillin seems the drug of choice when the responsible organism is penicillin-sensitive. It provides the physician with a means of attacking the microbic agent and so controlling the inflammatory process in the kidney during the acute stage. Case 3 merits special attention; under intensive penicillin treatment the kidney condition cleared up swiftly, while the acute mastoiditis was smouldering and finally surgical intervention was necessary.

I am indebted to Dr. J. Caradoc Evans, medical superintendent, for his help in preparing this record.

St. Charles' Hospital, London, W10. A. I. SUCHECKI.

ISHIHARA TEST OF COLOUR VISION

SIR,—During the present war it has been necessary to test colour vision on a larger scale than ever before. Many methods have been used both in this country and America, but the most popular of all has undoubtedly been Professor Ishihara's series of plates. It is pertinent to inquire exactly what information one obtains from the use of these plates. Among 587 persons with defective colour vision it was possible to classify the degree of defect roughly on the following scale:—

(*a*) Those who made a varying number of mistakes confined to plates 2–17 of the 8th edition.

(*b*) As in (*a*) but in addition the 6 in plate 22, and the corresponding figure in plates 23, 24, and 25 were misnamed or not seen at all.

(*c*) As in (*a*) but in addition no figures were correctly named in plates 22–25.

(*d*) As in (*a*) but in plate 22 the 6 was seen but not the 2, and similarly for plates 23 to 25.

When tested on the Giles-Archer colour perception unit[1] (aviation model), the results were as follows:—

(*a*) Misnamed standard yellow on the smaller aperture and occasionally called light green white—no other mistakes.

(*b*) The type of mistake in this group was the misnaming of the light green as yellow and the small amber as pale green or red.

(*c*) The reds and standard green were misnamed, in addition to mistakes similar to those under (*a*) and (*b*).

(*d*) Those in this category were very defective. Mistakes as in (*a*) to (*c*) were made and the signal blue green was misnamed.

Unfortunately the above classification is only roughly true. Of the 587 colour defectives examined, 445 fulfilled the above conditions satisfactorily, 98 were much worse on the lantern than would have been expected from their performance on the Ishihara plates, while 44 showed a better result on the lantern than would have been expected from the Ishihara plates. Of the total, 142 or 24% would have been wrongly categorised on the Ishihara test alone. Pickford[2] has suggested that this test is not scientific, nor very accurate so far as defective colour vision is concerned. On the other hand those able to read all the plates rapidly and correctly when the test is carried out at a distance of 2½ feet in good daylight (the order not being that in which the plates appear in the book) show no noteworthy departure from normal.

A possible exception to this is the person with a very slight shortening of the red end of the spectrum. Where this is of small degree he may read Ishihara plates without a mistake.

This test is a most useful, if not very scientific, means of sorting any large number of people into those with normal colour vision and those whose colour vision is abnormal even in a small degree. If this is borne in mind no great difficulty is ever experienced. If any attempt is made to classify the colour defectives on this test alone, difficulties at once arise.

JOHN GRIEVE.

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1. Giles, G. H. *Dioptl. Rev. & Brit. J. physiol. Optics*, 1935, 1, 23.
2. Pickford, R. W. *Nature, Lond.* 1944, 153, 656.

A CHAIR OF PSYCHIATRY

SIR,—As a non-partisan but as one who has had the unique experience of living for the last two years in a psychiatric hospital, neither as psychiatrist or patient, I feel I cannot let the letter of your anonymous correspondent, J. M., go unquestioned.

Both in discussions with my psychiatric colleagues and in your correspondence columns, I see no desire on their part more than that the best men should attain academic positions. It is, however, reasonable for medical men in the Services to hope that geographical inaccessibility and inability to make personal contact should not prejudice the principle of equal opportunity. This desire is understandable even in your correspondent's "untouchables"—the mental hospital doctors who, he believes, have changed their peace-time palatial quarters for Parker-Knolls in Burma. But he should know that forward psychiatrists and parachuting psychiatrists still exist, although at least one, bayoneted by Japanese, exists no longer.

Narcissism, insight, frustration, adulation, and other clichés culled from a textbook are irrelevant to a discussion of fair means to a fair end, as would be one on non-combatant guilt; but although the "heat and burden of battle" knows no frontier (and some of us have admittedly enjoyed our first immunity from bombing only since donning uniform), nevertheless opportunity for study, for academic advancement, and for patriotic payment of supertax probably comes easier to a civilian.

If J. M. wishes to leave civilian life, I would willingly
give hir
or other
any psy

S. CHARLES LEWSEN.

WASSERMANN AND REFRIGERATOR

SIR,—The Wassermann reaction and Kahn test are now almost "household words" and many place implicit reliance on the results of these laboratory procedures. Any masked source of fallacy in the performance of these tests deserves wide publicity.

In the course of my routine duties I noticed that a "control" negative serum turned "positive" after keeping a fortnight in a refrigerator. It is not unusual for a "positive" serum to turn negative on keeping, but the reverse process is uncommon. After a rather
ind that specimens of sera—
pt in a certain refrigerator
e "positive" Wassermanns.
gave negative results by the Kahn test, before and after cold storage. Specimens of sera or cerebrospinal fluid kept 24–48 hours in the refrigerator were unaffected. None of the specimens were frozen at any time. Negative sera and CSF specimens were duplicated; half of each was kept in the refrigerator for 7 days, and the other halves were kept in a contrivance cooled by circulating brine. The refrigerated halves were all "positive" by the Wassermann and negative by the Kahn technique; the other halves were all negative by both methods.

The refrigerator in question had been in constant use for over four years. Refrigerating engineers could find no mechanical defect nor leakage of gas; so far as refrigeration was concerned, the machine worked perfectly. I feel sure, however, that a leakage of gas, too slight to be detected by ordinary engineering methods, was the cause of our trouble. The refrigerant was, I believe, sulphur dioxide; it is possible that methyl chloride has a similar effect. When the refrigerator was new we could leave a sterile specimen of serum in it for three months with no apparent alteration in the strength of the Wassermann or Kahn; in fact the Kahn result seemed to become stronger with age. Latterly, however, the Kahn test turned from positive to negative and the Wassermann from negative to positive on keeping.

Refrigerators are much used now—not only in laboratories but even in theatres and wards—so perhaps it will help to cure some "headaches" if this experience is given publicity. The trouble is insidious because often unsuspected, although the remedy is fairly obvious.

FRANK MARSH,
Pathologist, Anglo-Iranian Oil Co.

FIBROSITIS

SIR,—In your annotation last week you say tha
the pathology of fibrositis, like that of sciatic neuritis, ha
always been obscure. There is a factor which has bee
very prevalent during these war years, although doub
less it existed before the war—namely that of trauma
tism. In their work in factories many people have ha
to undertake heavy and repetitive muscular movement
to which they were untrained and unaccustomed, an
have become victims of traumatic fibrositis. Suc

hopper's or mechanic'

iscular or ligamentou
, an external rotator
abductor, and flexor of the hip, notably in the "pyri
formis syndrome," a frequent cause of sciatica, an
a muscle which can be subjected to trauma. Spasm o
the masseter muscle, with negative radiography of th
temporo-mandibular joint, is often associated with
trigger area in the trapezius muscle, and relieved b
infiltration with 2% procaine, after which the patien
can open his mouth with ease. Calcareous deposit
take place in the tendon of the supraspinatus muscl
near its insertion to the humerus, and the probable sit
of trauma, so frequent in affections of the shoulder.

Trauma thus appears to be a bigger factor in th
causation of fibrositis than has hitherto been suspected
although it may not always be possible to get the
history of it.

Kew.   H. AUSTIN WILLIAMS.

ORTHOPTICS IN PEACE AND WAR

SIR,—Your leading article of March 31 calls for some comment, as some of the statements seem a little lacking in clarity, and others hardly borne out by the experience of some of us. Let me give a few instances.

1. "Sometimes also the latent squints of adults received attention." Does this term include heterophoria?
2. "Before the age of five, children do not cooperate well enough to allow of *any* squint training" (italics mine). This is not by any means correct. It is true that there are such children, but there are a very great number who will coöperate at an early age—some even at the age of 3½, and very many at 4.
3. "If the squint is transitory or very slight it is sometimes possible, when fusion has been taught, to train the eyes to the normal position, *but in the great majority an operation is necessary*." Surely not the great majority?
4. "Orthoptics by themselves are not a cure." This is not a good expression, even if it were accurate. It assumes that operation is more or less always needed, which is not the case; and neither orthoptics, and certainly not an operation "cure" a squint. It is the patient, when trained, whether an operation has been done or not, who "cures" the squint: for without his coöperation no cure can be effected. Perhaps a small point, but important, for it indicates a different approach, and a different appreciation of what the treatment really consists: it is "education" or "training" not "exercises."
5. ". . . one feels that there is a danger that those who practise orthoptics are relying too much on the readings of their machines and not allowing enough for the human element." Surely it is the duty of the orthoptist to study the readings of the machines, and for the ophthalmologist to allow for the human element. The former should send the report to the latter, who should assess and interpret these readings. Thus the fault lies rather with the ophthalmologist than with the orthoptist, if the human element is ignored.
6. "The anxious neurotic" is to be found in every practice, and I agree that he is not a suitable subject for orthoptic training. But is he so common in civil practice? I cannot speak for the Services?

I regret that all my comments seem to disagree with your article; but my own view is that we do not yet know enough about the subject to be able to make dogmatic statements. In fact the more we learn, the more there seems to be learnt.

Hove, Sussex.   J. P. SPENCER WALKER.

TIMEO DANAOS ET DONA FERENTES

SIR,—The Ministry of Health has recently forwarded to the ear, nose and throat department of our County Hospital an elaborate equipment of instruments costing at least £100. These instruments were not asked for; many of them, in my opinion, are obsolete, and practically none of them meet with my personal requirements as a surgeon; the hospital was already well equipped with instruments chosen by those who were to use them. On my sending a polite expostulation I was told that "the instruments have been selected by the Minister's consultant adviser for Ear, Nose and Throat Centres; after allowing for such equipment held by the Hospital, they represent what is considered necessary for the work of an Ear, Nose and Throat Department of the class of your Hospital in the Emergency Hospital Scheme. It is appreciated that a standard list cannot be universally acceptable, but deferment to individual preferences is not possible in ordering for a large number of centres, especially in present supply conditions."

Now, had the issue been made of instruments which had some relation to our requirements the cost might have been £10; as it is, the cost must have been over £100, and the majority of the instruments will be placed in a store and not used. Much as I appreciate the Father Christmas spirit, the wastage of money and material is pitiful. Nor is that the most melancholy aspect of the matter.

Surgery is a personal art, and it is an indignity to impose standardised equipment upon a craftsman, as though he were a factory hand working to a blue-print. Future discussions with Whitehall may very likely revolve round the question of remuneration; but that matters hardly at all. What does matter is that the sterile mentality which is already insidiously at work trying to standardise our methods and ideas should be rejected with all the energy we command.

It may seem a small matter to dwell upon, but I do not think it is a small matter that a profession hitherto responsible for its own discipline and ordinances should be threatened by a subtle and increasing control by outside influences, well-meaning enough but insensitive to an incredible degree.

Intellectual castration is an alien tradition. If we cannot tolerate originality—even eccentricity—then vitality and genius we shall assuredly quite soon find ourselves bereft.

Brighton. D. A. CROW.

*** We are informed that the supply position during the war has prevented the Ministry supplying each individual surgeon with the make of instrument he prefers and has made it necessary to order generally acceptable makes selected by their consultant advisers. The Ministry supply hospitals, not individuals, and each hospital is given articles in the standard set that it does not already possess. A particular surgeon may prefer to use others; but in equipping a hospital the Ministry hold that they must see that there is a standard set available for the treatment of the patients for whom they are responsible.—ED. L.

WHITER BREAD

SIR,—In your leader of March 17 you say that phytic acid in high-extraction flour is neutralised by the addition of calcium. This statement is unfounded. It is true that if a subject is given first white bread and afterwards brown the calcium balance becomes negative. But this has nothing to do with phytic acid, as we have shown (Harris, I., Vernon, C. E. *J. Physiol.* 1943, **102**, 20P). If a subject is in the habit of eating a brown loaf fortified with calcium, and he is afterwards given brown bread of the same extraction but without the added calcium, the calcium balance does not become negative. Here are the actual figures obtained from a subject after eating brown bread to which calcium was not added: calcium intake 0 737 g.; calcium output in urine 0·172 g., in fæces 0·565 g., in urine and fæces 0·737 g. Output 100% of the intake.

It is clear that if phytic acid were the cause of the negative calcium balance, the eating of brown bread without added calcium should have produced a negative balance, which it did not. I can only suppose that the w[illegible]tic acid theory is a figment of the imagination. Clearly too the authorities themselves do not believe in it; for I understand that the calcium is still being added to the much whiter bread eaten at present.

Liverpool. I. HARRIS.

REABLE OR REHABILITATE?

SIR,—Must we indeed "reable"? Revolting as "rehabilitate" is, bearing as it does the smack of "static water" and "dehydrated vegetables." I doubt if it is quite such an unpleasant mouthful as "reable," which we may confidently expect to find very shortly on Mr. A. P. Herbert's black-list, or relegated to the "barbarisms" section of a new edition of Fowler. Indeed I expect that many of us will be unable to "reable."

There seems to me only one place where "reable" would be appropriate, and that is, most appropriately, in the word "disagreable."

Why is there this extraordinary anxiety to make two ugly words grow where one beautiful one grew before? For have we not already that splendid word "restore," and its noble, inspiring, and harmonious noun "restoration?" Though Shakespeare may have used the verb "to able," I cannot believe that he would have approved of "Malvolio, thy wits the Heavens reable."

Haywards Heath. J. W. SHACKLE.

SIR,—Sir Edmund Spriggs wrote to me some eighteen months ago urging the use of the word "reable." It is altogether a more attractive and euphonic word, but it shares with "rehabilitate" one great disadvantage, it does not lend itself to the form "reabler"—a pity. Physical medicine, physiotherapy, and rehabilitation are all clumsy words for use in describing the practitioner in the subject. But to have to say in answer to the question "What are you?" "I am a reabler," is alas unthinkable. A good word is urgently needed.

London, W1. C. B. HEALD.

Public Health

Case of Confluent Smallpox from North Africa

ON March 22, 1945, a distressed British seaman boarded a troopship which was on its way from the East to the United Kingdom, where it arrived at a north-western port on March 30. The man had been under treatment for "catarrhal fever" in a North African Army hospital from Feb. 24 until March 8; he had afterwards lived at a Merchant Navy club in the North African port and had frequented the native quarters, where it is most likely he was infected with smallpox. He had never been vaccinated.

History of illness.—On March 27—that is, 5 days after coming on board the transport—he developed a sore throat and his temperature was 102·2° F. He was placed in the isolation hospital immediately, where isolation was strict. He was given codeine, aspirin, and diamorphine, and next morning his temperature was normal and his throat was better. On March 29 a macular rash appeared on his face only. His temperature was normal in the morning but rose to 99° F. in the evening. He felt well. On the morning of the 30th his temperature was subnormal but the rash was appearing quickly on his body and limbs. When seen by the port boarding medical officer on that day the eruption was profuse on the trunk and face, and there were one or two macules on the palm of the left hand but none on the soles of the feet. He was removed to the smallpox hospital in Glasgow. Since his admission he has been very ill with confluent smallpox, but the illness has apparently responded to large doses of penicillin, and he is expected to recover.

Administrative measures.—The full complement of the troopship on arrival at the port was 3681, which included 378 crew, and 509 first-class, 42 second-class, and 2752 third-class passengers. Among these were members of various Services, together with military and civilian families, 421 ex-prisoners-of-war and 101 distressed British seamen—altogether a very mixed ship's company. It was very desirable that disembarkation should not be delayed, but vaccination of the ship's complement was thought essential before this could be allowed. A number of the passengers, including children and distressed seamen, had not been vaccinated before. In the early evening of March 30 a team of doctors from the Glasgow Public Health Department, with the help of military medical officers, vaccinated all on board, and this was completed before midnight. Four distressed British seamen who had been in close contact with the patient before he was isolated on the ship were sent to

medical
assengers
were going were notified of the contacts who would be arriving in their areas. It was also possible, through the Service authorities, to inform civil medical officers of health of the arrival of contacts at Services camps and depôts. The ship was disinfected at the anchorage.

Infectious Disease in England and Wales

WEEK ENDED MARCH 24

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1522; whooping-cough, 1453; diphtheria, 499; paratyphoid, 3; typhoid, 8; measles (excluding rubella), 25,507; pneumonia (primary or influenzal), 866; puerperal pyrexia, 17 cerebrospinal fever, 88; poliomyelitis, 4; polio-encephalitis, 1; encephalitis lethargica, 1; dysentery, 420 ophthalmia neonatorum, 81. No case of cholera, plague or typhus fever was notified during the week.

Deaths.—In 126 great towns there were no deaths from enteric fever, 1 (0) from scarlet fever, 32 (4) from measles, 9 (0) from whooping-cough, 5 (0) from diphtheria, 19 (6) from diarrhœa and enteritis under two years, and 28 (4) from influenza. The figures in parentheses are those for London itself.

[1] Birmingham reported 4 deaths from measles. There were 7 fatal cases of diarrhœa at Birmingham and at Leeds.

The number of stillbirths notified during the week was 220 (corresponding to a rate of 33 per thousand total births), including 20 in London.

WEEK ENDED MARCH 31

Notifications.—The following cases of infectious disease were notified during the week smallpox, 0; scarlet fever, 1361; whooping-cough, 1123; diphtheria, 495; paratyphoid, 4; typhoid, 18 measles (excluding rubella), 22,183; pneumonia (primary or influenzal), 746; puerperal pyrexia, 138; cerebrospinal fever, 66; poliomyelitis, 6; polio-encephalitis, 0; encephalitis lethargica, 4; dysentery, 391; ophthalmia neonatorum, 64. No case of cholera, plague, or typhus fever was notified during the week.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 21 (3) from measles, 11 (2) from whooping-cough, 6 (0) from diphtheria, 49 (8) from diarrhœa and enteritis under two years, and 27 (2) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 186 (corresponding to a rate of 31 per thousand total births), including 20 in London.

Medical Society of London.—The discussion on the deferment of senescence which Mr. W. Sampson Handley was opening on April 9 has been postponed till Monday, April 23, at 5 PM.

British Association of Urological Surgeons.—At a meeting of 40 urological surgeons held on March 17 at the Royal College of Surgeons of England, under the chairmanship of Sir Alfred Webb-Johnson, FRCS, it was decided to form an association under this name. The following officers were elected: president, Mr. R. Ogier Ward; vice-president, Mr. Bernard Ward, secretary, Mr. E. W. Riches; treasurer, Mr. John Everidge; editorial secretary, Mr. H. P. Winsbury-White; members of council, Mr. A. Wilfrid Adams, Mr. David Band, Mr. Arthur Jacobs, Mr. J. B. Macalpine, Mr. T. J. Millin, Mr. A. Clifford Morson, Mr. R. H. O. B. Robinson, Mr. C. A. Wells. The association may be addressed at the college, Lincoln's Inn Fields, London, WC2.

On Active Service

CASUALTIES

DIED OF WOUNDS

Captain GORDON SPENCER SHEILL, MC, MB DUBL., RAMC

DIED

Lieut.-Colonel GAVIN ALEXANDER ELMSLIE ARGO, OBE, MC, MB ABERD., LDS, RAMC

Major ERNEST LAWRENCE HOLDEN ELLIS, MD MANITOBA, RAMC

AWARDS

CBE

Colonel JAMES MELVIN, OBE, MC, MB ABERD., RAMC

DSO

Lieut.-Colonel M. E. M. HERFORD, MBE, MC, MB BRIST., RAMC

OBE

Lieut.-Colonel A. McC. CAMPBELL, DSO, MB GLASG., RAMC
Lieut.-Colonel MARTIN FALLON, M CH DUBL., RAMC
Lieut.-Colonel J. A. FINEGAN, MB GLASG., RAMC
Lieut.-Colonel C. E. GALLAGHER, MRCS, RAMC
Lieut.-Colonel R. L. HOLT, FRCS, RAMC
Lieut.-Colonel F. HEYWOOD JONES, MB LPOOL, RAMC
Lieut.-Colonel H. W. EVERLEY JONES, MB LOND., RAMC
Lieut.-Colonel A. F. KENNEDY, MB DUBL., RAMC
Lieut.-Colonel F. L. KER, MB EDIN., RAMC
Lieut.-Colonel W. J. McINTOSH, MB GLASG., RAMC
Colonel W. H. MARSTON, MB BIRM., RAMC
Lieut.-Colonel B. M. NICOL, MB ABERD., RAMC
Lieut.-Colonel G. E. ORD, MB ABERD., RAMC
Lieut.-Colonel SCOTT-RUSSELL TRICK, MB LOND., RAMC
Lieut.-Colonel D. H. YOUNG, MD ONTARIO, FRCSE, RAMC

MBE

Major D. E. H. BEATTIE, MB EDIN., RAMC
Major R. G. EVANS, MB LOND., RAMC
Major MATTHEW HUNTER, MB EDIN., RAMC
Major J. B. MACKAY, MB ABERD., RAMC
Major J. D. McLENNAN, MD ABERD., RAMC
Major ANGUS MACLEOD, MB GLASG., RAMC
Major K. D. STEWART, MB, RAMC
Major D. J. WATTERSON, MB CAMB., RAMC

MC

Captain GABRIEL KARSTAEDT, MB LPOOL, RAMC

MENTIONED IN DESPATCHES

Surgeon Commander J. M. FLATTERY, RAN

RCAMC.—Lieut.-Colonels C. U. Letourneau, T. M. Sieniewicz; Majors G. C. McGarry, J. C. McKellar, R. B. Murray, H. A. Williams; Captains K. A. C. Clarke, J. H. Fraser and H. Marantz (killed in action); Lieutenants M. T. Cooper, R. Frechette, and J. Mackie.

MEMOIRS

Surgeon Lieutenant M. J. CLOW, RNVR, who died on Feb. 11, at the age of 30, while serving in Australian waters, was the first man in this war to receive the Albert

was
ool
and
at

Manchester Daily Mail

Manchester he graduated MB Camb in 1938. Before joining the RNVR in 1940 he had held house-appointments at Manchester Royal Infirmary, and the Crumpsall Hospital. In 1942 he took his MA and the following year obtained the MD for his thesis on pneumonia. For several years he held the Cheshire swimming championship (220 yd.), and he was a half-blue for swimming and water polo, which he also played for the Cheshire County and Sale Swimming club. "Mac had a bonhomie and breeziness of manner," writes R. W. L., "which, with his laugh, brought a breath of fresh air into every clammy atmosphere, social or diagnostic. What I remember best is his generosity. He gave away his lifebelt to a wounded shipmate when he was torpedoed, and it was characteristic that he made no mention of this act when he described how he came to be on survivor's leave. As a doctor, he acted on the principle that in many aspects of medicine there is no substitute for hard work. But one usually sensed that he was thinking beyond the routine work of a busy ward. His vigour and spontaneity carried him further than many of his age towards an understanding of life. He was a warm-hearted friend to many, and we shall miss him."

Annan

Captain DAVID WOOD, RAMC, who was killed on Dec. 18 during an air-raid while a prisoner-of-war in Germany, was the youngest son of the late Mr. Robert Wood of Rawyards Farm, Airdrie. Born in 1907, he was educated at Airdrie Academy, and after six years in business took up the study of medicine at Glasgow University, graduating MB in 1936. After qualifying he went into general practice, first in Newcastle and later in New Barnet, London. Within a few weeks of the outbreak of war he volunteered for the RAMC and was later posted to the Middle East. He took part in the Greek campaign in 1941, and during the evacuation from the Greek mainland he stayed behind to attend to the wounded on the beaches and fell into enemy hands. As a prisoner-of-war in Germany he was MO to the camp hospital. Although he was keen on all forms of sport, his favourite game was soccer, and soon after he arrived at the camp he started a soccer league, he himself playing centre forward for the Scottish team. Besides helping to relieve the tedium of camp life, Wood was at all times an outspoken and fearless champion of the men's interests. A man of good physique, he was quiet and modest in manner, and had a ready smile. Apart from sport, at home his chief hobby was gardening.

Lieut.-Colonel WILLIAM SIMPSON, RAMC, was accidentally drowned on March 17 at Kingston, Jamaica, where he was serving as assistant director of medical services in the North Caribbean area. He graduated at Glasgow in 1922 and had held appointments at Barnsley and Preston and under the LCC. After he joined the RAMC in 1940 he acted as liaison officer for the Midland region between the War Office and the Ministry of Health.

Parliament

QUESTION TIME

Women Medical Students

Dr. E. SUMMERSKILL asked the Minister of Health (1) what steps he proposed to take to provide tuition for the large number of women medical students who were unable to obtain entrance to hospitals, pending a change of policy of the teaching hospitals reserved for men; and (2) if he was aware that whereas male medical students were not called upon to sit for competitive entrance examination, the competition for the small number of vacancies allotted to female students was severe: and if, in view of the large additional numbers of doctors which would be required after the war, he was taking steps to increase the facilities for female medical students, and to abolish competitive examinations in their case. Mr. MESSER also asked the Minister if he was aware that a large number of women students who had taken their first MB were unable to obtain places in medical schools; and if he had any proposals to make to deal with this situation in view of the shortage of doctors.

Mr. H. WILLINK replied: It is necessary, in order that manpower may be allocated in the best way, to fix quotas for the numbers of men and women to be admitted as medical students. The women's quota is fixed by reference to the number of women students admitted in the three years 1937–40, and in addition a medical school which admits both men and women may make good the deficiency in male students by admitting women. Neither the teaching staff nor the accommodation is at present available for extending teaching facilities. I would, however, refer to the statements of policy made by the Chancellor of the Exchequer on Feb. 13 and by myself on Jan. 18 in which the Government have given every encouragement to universities to formulate plans at once for development of their medical schools as soon as conditions permit, with special reference to the needs of women students.

Dr. SUMMERSKILL: Is the Minister fully alive to the [illegible] this problem? Does he realise that there are brilliant young women who have passed their first medical who are now regarded as redundant, although there is an urgent need for doctors; and is he also aware that the quota that was fixed was determined by the fact that only four hospitals in London admit women, whereas every hospital admits men?—Mr. WILLINK: I am fully aware of the urgency of the question, not less because I have a daughter who is a prospective medical student. The real difficulty is the shortage of teachers and that is one of the matters to which we are paying particular attention.

Mr. MESSER asked if the Minister was aware that there were many students who were allowed to get up to their second MB and they could not get into hospital and thus all the time they had spent in study was wasted; and was he aware that much of the difficulty arose from lack of accommodation and would he consider the possibility of public hospitals becoming medical schools; and was he aware that what he had just said related to men and did not relate to women.—Mr. WILLINK: The possibility of the use of public hospitals for medical schools was fully considered by the Goodenough Committee.

Obituary

ALFRED WILLIAM SHEEN

CBE, MD, MS LOND., FRCS, TD, DL

A. W. Sheen, who died on March 28 at the age of 75, was a man of considerable versatility. He did good service in South Africa and India in the Boer War and the war of 1914–18; he was efficient as professor of surgery and director of the surgical unit at Cardiff: he was an authority on the work of Hunter; he took his part in local affairs and was a Deputy Lieutenant for the county of Glamorgan; he was a good friend and an excellent companion. But his outstanding success was his work as provost, the first provost, of a new school of medicine, the Welsh National School of Medicine.

He was the eldest of the eleven children of the late Dr. Alfred Sheen of Cardiff. From University College, Cardiff, he went to Guy's, where he qualified in 1892. Having held house-appointments at Guy's, Bethlem, and Cardiff, he joined the staff of the Cardiff Infirmary and married in 1898. On his return from South Africa, where he served as surgeon to the Imperial Yeomanry Field Hospital, he interested himself especially in the surgical conditions likely to be encountered in an industrial population, and with much experience of operating in the homes of the people and the smaller hospitals he had a good deal to do with the development of surgery in South Wales. His contributions to the medical press were useful and practical: he was an early advocate of prostatectomy; he gained special knowledge of splenectomy; and he was keen on the management of fractures.

In the last war he was at first commanding officer and senior surgeon of the Welsh Hospital at Netley, but in 1916 went to India as OC 34 (Welsh) General Hospital. He became consulting surgeon for war hospitals in India, and was appointed CBE. After the war he practised for a time in London, where he was visiting surgeon to the special orthopædic hospital at Shepherd's Bush. In 1921, however, he went back to Cardiff as first professor of surgery and director of the surgical unit in the Welsh National School of Medicine. Here he remained on the active staff of the Royal Infirmary till 1933, maintaining his special interest in reablement, especially after industrial injuries. Above all, however, he worked tenaciously to justify the new departures represented by his unit and the school.

During the discussions—sometimes heated—which heralded the establishment of the school as a separate entity within the University of Wales, there came a time when the post of dean of the faculty of medicine became vacant. E. L. C. recalls how, when the contesting parties met in 1927 to choose their leader, no-one was more astonished to find himself unanimously elected than was Sheen, who had not identified himself with either party. To be more astonished still were those who had placed him in office when they discovered the facility with which he undertook his new duties. Hence, when, in 1931, the school gained its freedom, there was no doubt as to the personality to fill the post of provost. And the post was no sinecure—to launch on its way a new school, constructed, largely on the initiation of Osler, on the American unit principle with whole-time professors as heads of each clinical department. Local rivalries, within and without the university, had to be met and negotiated. Today the school stands recognised as a fine training-ground for our profession, bearing witness to Sheen's success in his task. As a chairman he expounded business clearly, and at times freely, but never to the exclusion of the views of others; but most of his activities were carried out away from meetings by the use of tact and persuasion. His plans for the future of the school were on the grand scale, including a fine university hospital and complete medical school near the civic centre of Cardiff.

Sheen left the chair of surgery in 1935, but on the departure of his successor Prof. Lambert Rogers, for service with the Navy, he again shouldered the responsibilities of the department of surgery, which involved early lectures, ward teaching and the care of patients, in addition to the duties of provost. He had to travel much, attending meetings and conferences, but he carried on without signs of undiminishing activity. Systematic and thorough, he also enjoyed an "occasion," and was well able to preside and conduct official business with dignity. In private life he was very hospitable, and many outside examiners writes G. G. T., will remember the delightful time when they were guests in his home. He was fond of travel and was always welcome at the visits of the Moynihan Club and the congresses of the International Society of Surgery; he was a good talker, told a story with due emphasis, and always had a ready jest to point a moral. Sometimes a rather brusque dictatorial manner, or apparent flippancy, repelled those who did not know him well, but his heart was warm and generous and he was particularly kind to the young. His wife, a daughter of J. P. Ingledew, JP, of Cardiff, died in 1939, and they had no children.

E. J. M. writes: "Though not a good listener, Sheen was a man of ripe knowledge and great ability. Physically, and in some ways mentally, he resembled his distinguished father, Dr. Alfred Sheen, who is credited with the first (and successful) ovariotomy in the Cardiff area. Small wonder he obtained distinction in military service, from the South African War to the first World War and afterwards; for it came naturally to him to lead and to command. To be thwarted of a set purpose was to him an experience especially to be avoided. This quality, indeed, may have cost him dearly. For during a spell of very heavy snowfall which well nigh overwhelmed Cardiff in an early month of this year he, like many others, was made captive in his house in the suburbs. Most people resigned themselves to temporary imprisonment. Not so Sheen. With great effort he literally dug himself out, and thereafter, in the absence of any available transport, trudged four miles through the deep snow to his medical school office, where he had a circulatory collapse from which, notwithstanding every care over weeks in the Infirmary, he never recovered.

"As provost he has left his mark on the Medical School and he gave much thought to its development in the future under the oncoming Comprehensive Medical Service and the recommendations of the Goodenough Committee. To some of us his views as to the necessary development of the central hospital were unduly expansive, but with his excellent memory and facility of phrase Sheen could, in discussion, always establish a good case. Socially he was not of the hail-fellow-well-met type; but he had a real capacity for friendship and a touchi [illegible] for those fallen by the way [illegible] ame after the death of his [illegible] onset of her long illness, h [illegible] in all the major commitme [illegible] overseas.

"Sheen gave of his very good best for his country, his city, and his school."

British Institute of Radiology.—On Thursday, April 19, at 8 PM, at 32, Welbeck Street, London, W1, Prof. E. A. Owen, D SC, will deliver the Sylvanus Thompson lecture. On the following day at 4.15 PM, Dr. J. F. Brailsford is to give the Mackenzie Davidson lecture. His subject is to be the teaching of radiology.

JAMES BARRETT

KBE, CB, CMG, M D, M S, LL D MELB., F R C S, F R A C S

Sir James Barrett, whose death at the age of 83 is reported from Melbourne, was a man of many interests and great energy. A leading ophthalmic surgeon in his own city, he served with distinction in the war of 1914–18 as consulting oculist to HM Forces in Egypt and as ADMS to the Australian Forces there. He was vice-chancellor of the University of Melbourne from 1931 to 1934, and afterwards chancellor, and was president of the British Medical Association at its Australian meeting in 1935.

He was the son of a doctor; he entered Melbourne University at 15, when it had only 200 students, and when he came to his third medical year there were only 10 in his class. After two years as resident medical officer at the Melbourne Hospital he came to Europe, where he was demonstrator in physiology at King's College, London, and worked in Berlin and elsewhere. On his return to Melbourne he was appointed to the staff of the Melbourne Eye and Ear Hospital, and demonstrator in physiology. The lectures on the special senses which he gave during more than forty years described admirably the scientific facts and their application to clinical work.

As long ago as 1901 he joined the council of the university, and soon became actively engaged in its reorganisation. He afterwards recalled that the two chief difficulties with which he had to contend were the indifference, and even hostility, of the public, and the [illegible] ersity to new [illegible] inovators were [illegible] be attempted until existing departments were properly provided for: "this of course meant that nothing new would ever be undertaken, as there is no limit to the legitimate aspirations of any department." Barrett was the first to admit that (as he put it) "no sensible man advocates new courses just because they are new"; but he was himself essentially an originator. Versatile and full of ideas, he well deserved his nickname of the Gadfly.

Of very many projects which he launched, not all survived; but in presenting him with his portrait in 1939 the Lord Mayor of Melbourne estimated that he still retained his interest in 28 committees, of which he was president of 11, vice-president of 2, chairman of 7, and hon. secretary of 3.

Outstanding among his achievements was the Victorian Bush Nursing Association, of which he was founder and hon. secretary; this brought to many small country towns in the State a hospital service of remarkable efficiency, and Barrett was rightly proud of the hospital insurance system described in his presidential address to the BMA. He was also one of the founders of the Royal Australasian College of Surgeons, and in the university did much to create the schools of education, agricultural education, mining, commerce, and veterinary science, and the university extension department. His fellow-countrymen owe to him the Wyperfield National Park and the sanctuary at Wilson's Promontory, and he was among those who saved the koala bear from extinction. In his garden at Toorak in the Melbourne suburbs he kept a small private zoo, with wallabies and kangaroos. He was an authority on lilies, an advocate of decimal coinage, town-planning, and proportional representation, and a practical friend to Melbourne children, for whom he secured playgrounds. Of the innumerable other interests of a long life it will suffice to mention the Lady Northcote Permanent Orchestral Trust, of which he was chairman, and the Con [illegible] which owed him much. [illegible] someone came with a [illegible] of it quickly and then (striding up and down his consulting-room) would dictate a letter to the press, sign it, "and then go on to the next thing that needed gingering up." But he would also work long and patiently to gain great ends. Likeable and extremely kind, he was never too busy to give up time to a student or young practitioner.

Sir James Barrett was appointed CMG in 1911, and CB and KBE in 1918. By his first marriage he had two sons and three daughters, and one of his sons was killed in the late war.

Notes and News

SOUND FEET

When a quasimedical book is produced for popular reading the question springs to mind "Is this information or propaganda?" The propaganda type necessarily deal with diseases, and nearly always emphasise the need for seeking advice at an early stage when symptoms are usually quite minor. Such books are in the nature of two-edged swords, for they can be prolific causes of neurosis and hypochondriasis in the otherwise healthy. With neurosis on the increase any action likely to add to the incidence should be strictly avoided. Fortunately the foot is not a common site of reference for neurotic symptoms (although it is surprising how many people develop an obsession about a non-existent flat foot), and so while *Take Care of Your Feet* (Foot Health Educational Bureau. Pp. 129. 5*s.*) is primarily propaganda, little objection can be taken to it on this score, especially as much of its matter is informative.

It is a symposium contributed to by orthopædic surgeons, doctors, chiropodist, physiotherapist, shoe manufacturer, leather expert, and tanner, among numerous others. The language is non-technical, and the lay reader will find it easy to understand both the letterpress and the drawings which accompany it. Possibly the general public may complain that there is really nothing in the book which actually tells them how to avoid many of the foot troubles from which they suffer; and they may correctly guess that in many instances the experts themselves are not able to point to causative factors with assurance. It is not enough, for instance, to tell a patient with ingrowing toenail that his trouble is due to crowding of the toes in a narrow toecap, when he protests that he has never worn footwear with these characteristics.

While orthopædic specialists differ so considerably in their views on the ætiology and nature of many foot troubles, such as flat foot, perhaps the time is scarcely ripe for offering guidance to the public except on simple matters of hygiene and shoe fitting. This book does that well. The chapters on the making, repairing, and fitting of shoes, and those on leather and tanning, are especially instructive.

University of Cambridge

Brigadier Sir Lionel Whitby has been elected an honorary fellow of Downing College.

Royal College of Obstetricians and Gynæcologists

The following have been elected to the fellowship:

G. S. Adam, Caroline A. Elliott, E. A. Gerrard, A. M. Hill, J. J. Kearney, R. J. Kellar, A. Meave Kenny, W. K. McIntyre, B. T. Mayes, H. K. Pacey, Frank Stabler, F. R. Stansfield, and G. A. Thompson.

The following have been awarded the diploma of the college:

Isabel H. M. Blyth, J. T. Carson, H. J. A. Conte-Mendoza, G. K. Emsley, J. L. Farmer, J. J. Handler, Denzil Heap, Alistair Henderson, Michael Hutchinson, William Johnston, E. E. Jones, Kathleen Lawrence, Betty J. Poland, and D. B. Stewart.

Negotiating Committee's Report

The London Association of the Medical Women's Federation, which is represented on the committee, will meet to discuss the report on Saturday, April 21, at 3 PM, at BMA House, Tavistock Square, WC1.

Association for Scientific Photography

At a meeting to be held at 2.30 PM on Saturday, April 21, at the Caxton Hall, Westminster, Mr. E. Mackie will speak on requirements for micrography and cinemicrography apparatus.

Faculty of Radiologists

On Friday, April 20, at 2.30 PM, at the Royal College of Surgeons, Lincoln Inn Fields, London, WC2, Mr. G. F. Stebbing will deliver the Skinner lecture on the diagnosis of cancer in a national medical service. The annual meeting of the faculty will take place in Leeds on Friday and Saturday, June 29 and 30 (not June 28 and 29 as previously announced).

Postgraduate Lectures in Edinburgh

A series of Honyman Gillespie lectures, open to graduates and senior students, is to be held at Edinburgh Royal Infirmary, at 4.30 PM, on Thursdays. Mr. I. S. Smillie is to speak on the stiff knee-joint in fracture of the femur (April 19); Prof. T. Ferguson on employment and health (May 3); Major C. E. van Rooyen on infective hepatitis (May 24); Dr. A. S. Johnstone on dysphagia due to causes other than malignant disease (June 7); Mr. W. Quarry Wood on duodenal 14); and Dr. C. Kelman Robertson on post- y complications (June 21).

Royal Society of Medicine

There will be a meeting of fellows of the society on Tuesday, April 17, at 5 PM. On April 18, at 2.15 PM, at the section of comparative medicine, Lieut.-Colonel C. H. Stuart-Harris, Mr. J. S. Carmichael, and Dr. Raymond Lewthwaite will open a discussion on the control of rickettsial infections. On April 20, at 6.30 PM, the section of radiology is holding a joint meeting with the Faculty of Radiology and the British Institute of Radiology. Dr. Frank Ellis, Dr. J. W. McLaren, and Mr. J. Read, PH D, will open a discussion on the standardisation of radiological apparatus.

Guests from Liberated Europe

A French medical delegation are at present visiting this country as the guests of the British Council and the Royal College of Physicians. The members are as follows: *Académie de Médecine:* Prof. A. Baudouin, dean of the Faculty of Medicine, Paris, Prof. A. Lemierre, and Dr. P. F. Armand-Delille; *Conseil Supérieur de Médecine:* Dr. Ravina, Dr. A. Laporte and Dr. H. Descomps; *Provinces:* Prof. C. Soula (Toulouse), Prof. Gernez-Rieux (Lille), Prof. J. Roche (Marseilles), and Dr. M. Nédelec (Angers).

Four groups of Belgian professors are also to visit this country during the next three months. The first group, who will be here from April 16 to 30, will include Prof. N. Goormaghtigh (Ghent), and Prof. P. Govaerts (Brussels).

Appointments

BAUEROVA, OLGA, MD BRATISLAVA, DMR: radiologist diagnostician, Leicester Royal Infirmary.

CARTWRIGHT, W. H., MB LOND., examining factory surgeon for Ilminster.

HEPBURN, JANET W., MB GLASG., DPH: acting MOH for Grimsby.

LEFF, SAMUEL, MD LOND., DPH: temp. senior asst. School MO and acting deputy MOH for Tottenham.

POWELL, K. W., MB LOND., FRCS: resident surgeon, Brighton Municipal Hospital Services.

Births, Marriages, and Deaths

BIRTHS

ALLAN.—On March 28, in London, the wife of Lieut.-Colonel Hamish Allan, RAMC—a son.

ATKINSON.—On March 26, the wife of Dr. A. H. B. Atkinson, of Dunster, Somerset—a son.

BOMFORD.—On March 15, the wife of Lieutenant W. B. N. Bomford, RAMC, of Salford Priors—a son.

DANIEL.—On March 28, at Oxford, the wife of Dr. Peter M. Daniel—a daughter.

FARQUHAR.—On March 31, at Oxford, the wife of Captain Gordon Farquhar, RAMC—a daughter.

GOODHART.—On April 4, in London, the wife of Surgeon Lieutenant John Goodhart, RNVR—a daughter.

HARVEY.—On April 1, at Moradabad, India, to Dr. E. Margaret Harvey, the wife of Lieut.-Colonel C. C. Harvey, IMS—a son.

JONES.—On March 30, at Brentwood, Essex, the wife of Captain M. T. I. Jones, RAMC—a son.

ORD.—On April 3, in London, the wife of Major J. W. E. Ord, RAMC—a son.

POWELL.—On April 5, at Harrogate, the wife of Captain C. E. Powell, RAMC—a daughter.

WILLIAMS.—On March 27, at Wolverhampton, the wife of Squadron-Leader Bryan Williams, FRCSE—a son.

MARRIAGES

COTTRELL—HARWOOD.—On March 12, at Birmingham, Thomas Cottrell, to Joan Evelyn Harwood, MRCS.

MURRAY—CARGILL.—On April 3, in London, Robert Murray, major RAMC, to Noreen Cargill.

SIMMONS—HUTTON.—On April 5, at Salisbury, Arnold Benjamin Simmons, MRCS, of Andover, to Mary Hutton (née Radford).

DEATHS

BURKE.—Recently, in Manila, William Joseph Butler Burke, MD DUBL., professor of medicine at the University of Santo Tomas.

CAMPBELL.—On April 6, at Perth, John William Campbell, MD PARIS, MB CAMB., MRCP, DPH, of Mentone, France, and Layer Marney Hall, Essex, aged 79.

COFFEY.—On April 3, in Dublin, Denis Joseph Coffey, MB RUI, LL D DUBL.

EVANS.—On April 5, at Sidmouth, Evan Laming Evans, CBE, MD CAMB., FRCS, aged 73.

GARRETT.—On April 2, at Chandler's Ford, Hants, Raymond Reynolds Garrett, MRCS, aged 66.

KENNISH.—On March 28, Joseph Kennish, LRCPE, of Clapham Common.

MARLIN.—On April 5, at Bushey Heath, Herts, Thomas Marlin, MD GLASG., DMRE.

ORME.—On April 7, Gilbert Orme, MB CAMB., of Gilbert Street, Grosvenor Square, London.

PEGGE.—On April 4, George Pegge, MA CAMB., MRCS, of Harley Street, London, W1.

REES-JONES.—On March 27, at Lytham St. Annes, Edward William Rees-Jones, MD GLASG., DPH.

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CLOSTRIDIAL INFECTIONS IN WAR WOUNDS

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CLOSTRIDIAL infection of wounds in human subjects is essentially a war-time problem. The experience of the last war has been summed up in the Medical Research Council Report on Anaerobic Wound Infection (1919). Little fresh information has been added on the clinical side since then, although much more information is now available on the nature of the toxins elaborated by the clostridial group of organisms (McClean and Hale 1941, McClean 1943, Macfarlane and Knight 1941). The main outstanding problems are concerned with the factors affecting the local spread of the infective process and the nature and ætiology of the systemic reactions. The former can be adequately studied only if facilities are available for controlled experimental work on clostridial [illegible] can be investigated by examina[illegible] tent toxins and correlation with [illegible] Since we were not in a position to carry out work on experimental clostridial infections, the problem of local spread is not dealt with in this paper. The effect of clostridial toxins on body tissues and fluids has, however, been studied with special reference to the effects on the body lipoids and has been published in our previous paper.[1]

The ev[illegible] the West[illegible] 1944, affc[illegible] clinical observations. For this purpose cases which showed a systemic reaction and gave evidence of clostridial infection were examined, and these observations are reported here. It must be emphasised that the systemic reaction in these cases is not necessarily due to clostridial infection. This possible relationship and the correlation of these observations with our experimental findings is discussed below.

MATERIAL

Over a period of four months, 2080 wounded men have been under observation and treatment in the Queen Elizabeth Hospital (QEH). A few have arrived within 30 hours of wounding, but the great majority have arrived between the third and fifth days. They have almost all been brought by air and train many hundreds of miles. They have all got over the initial shock after wounding, and it was only the exceptional case that arrived in poor condition. Thus, in many ways they are a selected series. Chest, abdominal, and head cases are included among them. Among these 2080 patients we have encountered 76 who have been ill with a systemic reaction. The time of onset of systemic reaction in 70 of these cases was as follows:

Day	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
No. of cases ..	2	2	14	14	8	19	4	1	1	1	0	1	1	2	0

It will be noted that the great majority occur between the third and sixth day after wounding; 2 were diagnosed as "gas-gangrene" before admission and had again become ill. The average time from wounding to wound toilet was 15 hours, with extremes of 3 and 40 hours. The sites of wounding were as follows, the thigh and calf predominating.

	Thigh	Calf	Shoulder	Arm	Buttock	Forearm
With fracture	14	13	2	4	0	2
Without fracture ..	22	9	5	1	4	0

Clinical Diagnosis

The diagnosis of the systemic reaction and clostridial infection has been made primarily on clinical grounds. Histological examination of biopsy material and bacteriological study of muscle from the wound has been carried out in most cases.

SYSTEMIC REACTION

The patients as a group present an almost characteristic picture. They are pale, slightly sallow and cyanosed, which gives their complexion a greyish appearance, which may persist for as long as three weeks. Improvement in appearance takes place quite rapidly and [illegible] ents are [illegible] do not [illegible] erulous. [illegible] mental awar[illegible] aintained.

Wh[illegible] teriorating, the skin may [illegible] moderate cases it is usually moist and clammy for many days. In most of the moderate cases, and in all the severe group, the [illegible] to between 25 and 30 per min. [illegible] y non-productive. [illegible] nded men in this hospital is fair [illegible] st cases it settles down in a few [illegible] of mine injuries and possible exposure to blast may account for this. Appetite, in the absence of sulphonamide toxicity, is a sensitive indicator of systemic reaction. It is rare for a good appetite to be retained in cases showing systemic reaction.

The mere presence of anæmia is of no real diagnostic help, for the distribution of severe anæmias when first seen in these cases does not greatly differ from that of other wounded patients. The subsequent alteration in the blood-picture is a valuable indication of the progress of the infection.

The presence of rising temperature and pulse-rate has always been stressed. In many cases, however, the temperature may swing between 99° and 100° F, with the pulse-rate between 95 and 105 per min. for some days, yet the patient may be deteriorating with obvious evidence of systemic reaction.

LOCAL SIGNS

Local discomfort in the wound persisting in spite of all efforts such as bivalving the plaster, and occasionally [illegible]

whether or not clostridial organisms were present.

Classification of Clinical Material

Using this clinical approach and the broad criteria described above, a group of cases has been separated. This group were obviously more ill than the other wounded men, the local condition of their wound was unsatisfactory, and in nearly all of them confirmatory evidence of the presence of clostridial organisms was obtained. It is suggested that this group includes at least the majority of potential "gas-gangrene" cases among the series of wounded men.

For purposes of discussion our cases may be roughly divided into 4 groups, according to the severity of the systemic reaction observed.

1. Cases with mild systemic reaction lasting 2–3 days (24 cases).
2. Cases with a moderate systemic reaction of longer duration and sufficient severity for the patient to be [illegible] on the "Seriously Ill" or "Dangerously Ill" li[illegible]s).

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* Sir Halley Stewart research fellow.

[1] See THE LANCET of April 14, 1945, p. 457.

3. Cases of severe systemic reaction considered by the surgeon in charge of the case to be endangering the patient's life (9 cases).
4. Fatal cases (2 cases).

Illustrative case-reports from each of groups 1–3 and a more detailed account of the fatal cases are as follows :

GROUP 1 : 24 CASES

CASE 18.—Through-and-through wound right thigh. Penetrating wound left thigh. Wound toilet at 12 hr. Systemic penicillin 400,000 units. Sulphonamide, 7½ g., before admission to QEH 48 hr. after wounding. General condition good. Temp. 99° F, pulse-rate 104 per min.

Operation : left thigh healthy ; right thigh, non-contractile muscle, apparent red necrosis in upper end of sartorius ; whole segment removed down to healthy muscle.

Hæmatocrit 29 c.cm. ; CO_2-combining power 51 vols. %. Cholesterol 50 mg. per 100 c.cm. Creatine output in 24 hr. after operation, 1707 mg. Red cells 4,170,000 per c.mm. ; Hb. 60% ; white cells 14,850 per c.mm. (polymorphs 75%) ; reticulocytes 5·8%. Flocculation test positive.

Treatment : 16,000 units anti-gas-gangrene serum (AGGS) intramuscularly. Systemic penicillin 1,020,000 units over 6 days. Film showed possible clostridia, but no growth on culture. Temp. rose to maximum of 100·4°, pulse 88 on day after operation, but fell to normal levels thereafter, patient being allowed up 12 days after operation. Hæmoglobin fell to 53% on third day after operation, but gradually improved to 74% ten days later.

CASE 19.—Lacerated wound left leg with comminuted fracture tibia and fibula. Wound toilet at 6 hr. Sulphonamide 7½ g., and systemic penicillin 160,000 units before admission to QEH on third day. Condition fairly good. Temp. 99°, pulse 100.

Operation : wound œdematous ; muscle damage pronounced, with no contraction on stimulation ; moderate purulent reaction ; much muscle excised until healthy bleeding muscle reached ; penicillin powder instilled.

Treatment : AGGS 60,000 units intravenously (IV) in theatre. Systemic penicillin 820,000 units over 6 days. Culture yielded massive growth of *Cl. bifermentans*, β-hæmolytic streptococci (group D), and non-hæmolytic streptococci.

Temp. 100·6° on day after operation, but thereafter never above 99°. Evacuated 3 weeks after admission in good condition. Cholesterol and flocculation tests not done.

GROUP 2 : 41 CASES

CASE 16.—Perforating wound of right shoulder, entrance in upper third arm, exit in midscapular region, with oblique fracture of upper end of humerus and severe comminution of blade of scapula. Wound toilet at 24 hr. after wounding, with extensive excision of necrotic muscle. Sulphonamide 15 g., penicillin 400,000 units, and AGGS 45,000 units before admission to QEH 96 hr. after wounding. Temp. 97·8°, pulse 84, hæmoglobin 64%.

Examination of the wound showed numerous areas of pale non-contractile muscle ; only frankly necrotic material was excised and the wound dusted with sulphanilamide-proflavine powder. 48 hr. later, hand œdematous, severe pain in the shoulder, raised respiration-rate, skin sweaty, and appearance pale, cyanosed, and sallow. Inspection of the wound showed excessive amounts of interstitial fluid containing large numbers of fat globules with little or no hæmorrhage from the muscles. Superficial muscle was pale, not bleeding well ; deep muscles were frankly necrotic in some areas and most of suprasupinatus was excised.

Treatment : 300,000 units AGGS IV in 60 hr. after operation, and penicillin 1,900,000 units over 13 days. Patient remained severely ill for the next 3 days ; temp. 101°, pulse 100–110, respirations 25–30. Hæmoglobin after 3 pints of blood only 68%. *Cl. welchii* was cultured from both specimens. 24 hr. urine specimen between the operations contained 2160 mg. creatine, serum cholesterol 42 mg. per 100 c.cm., and flocculation reaction strongly positive. Hæmoglobin 74% 14 days after operation, although 2 further pints of blood had been given.

CASE 17.—Aged 25 yr. Depressed fracture left parietal area, compound fracture left femur, flesh wound right thigh, and wound of right calf. Debridement within 12 hr. Therapy before admission to QEH on 6th day : Sulphanilamide 20 g ; penicillin 900,000 units, AGGS 100,000 units. Temp. 102°. pulse 120, hæmoglobin 52%.

Operation showed maggots in three of the wounds. Head wound satisfactory and healing well. 24 hr. later temp. 101·8°, pulse 100, but general condition deteriorating, pale, sweaty, cyanosed, much pain in right thigh wound, well-marked apathy, hæmoglobin 56%. Examination 6 hr. later showed all wounds healthy except for small area at bottom of right thigh wound, where muscle was brick-red, non-contractile, and not bleeding ; this area was excised.

Treatment : AGGS 120,000 units intravenously in 48 hr., penicillin 1,060,000 units over 8 days. Temp. still raised next day. Hæmoglobin (after 2 pints blood) 65% with 10·6% reticulocytes. General condition much improved and patient almost out of danger.

For the next week patient continued to be rather apathetic, with poor appetite, but wound comfortable. Operation then revealed some necrotic muscle still present in wound. Hæmoglobin 72% with 8·6% reticulocytes. Convalescence was then relatively straightforward. Compound fracture wound soundly healed by end of 4 weeks.

Culture gave heavy growth of *Cl. welchii* and enterococci. Flocculation test strongly positive. Creatine excretion between 400 and 900 mg. for ten days. and cholesterol varied between 40 and 80 mg. per 100 c.cm.

GROUP 3 : 9 CASES

CASE 5.—Aged 29 yr. Entrance and exit wounds, front and back of right thigh. Debridement after resuscitation 9 hr. later. Plaster *uncomfortable during next day*. Received only 7½ g. of sulphonamide before admission to QEH.

Operation 60 hr. after wounding ; some œdema and gas bubbles present and note made—" Potential gas-gangrene." AGGS 25,000 units given intravenously. 48 hr. later collapsed, sweating, local œdema spreading on the abdominal wall, and such severe pain that the patient asked to be taken to the theatre. Extensive excision of necrotic muscle ; strikingly large amount of serous *fluid filling up the wound incision* rapidly. Note made—" No general ' gas-gangrene,' although small pieces of excised muscle cut and looked like gas-gangrene."

Treatment : 125,000 units AGGS, penicillin 1,690,000 units over 12 days.

A fairly heavy growth of *Cl. welchii* with many coliform organisms was cultured bacteriologically. Flocculation test strongly positive. Cholesterol 68 mg. per 100 c.cm.

GROUP 4 : 2 CASES

CASE 11.—Mortar wounds to right arm, hand, and ankle " slight." Debridement of all wounds within 12 hr., local sulphanilamide dressing. Good general condition. Sulphanilamide 12·5 g. given by mouth in first 72 hr.

Admitted to QEH and operated on 80 hr. after wounding. Temp. 98·8°, pulse 84. Arm wound unhealthy, dirty, muscle grey and necrotic-looking. Cavity extended and packed with sulphanilamide and soft paraffin gauze ; plaster-of-paris applied. Wounds of ankle and hand satisfactory.

During next 24 hr. temperaure rose to 100·4°, pulse 86, complaining of much pain, with the hand cold, œdematous, and blue. Plaster removed, drainage incision in posterior aspect of the wound. Packed with sulphanilamide cream and gauze. No extending muscle lesion was noted. Sulphathiazole 3 g. given, and 1 g. continued 4-hrly. Next morning temperature 100·4°, pulse 88. At 6 PM pulse 124 with temp. 102° : complaining of pain in arm and some pain in leg ; toes of right foot cold and numb. Plaster was split and toes became warm and leg more comfortable. Penicillin 100,000 units given. At 10 AM next day temperature 98°, pulse 110. respirations 28. Some pain in the arm ; fingers cold but able to move them. At 12.30 PM suddenly noticed to be sweating, cyanosed with rapid feeble pulse, restless and anxious, and complaining of difficulty in seeing. Blood-pressure 85/50 mm. Hg. Given 3 pints of plasma intravenously immediately, with 120.000 units AGGS, and followed by 1 pint of blood. Hæmoglobin 104%. At 2 PM CO_2-combining power was 51 vols. %. Some temporary improvement followed, but he died at 6.45 PM. Total penicillin given, 160,000 units.

Autopsy was carried out within 2 hours of death by Prof. Haswell Wilson, who reported as follows :

Well-developed, well-nourished young man. Gunshot wound (GSW) on outer side of right arm above elbow, with small skin wound on back of right hand. Extensive œdema of right arm and right side of chest. GSW on outer side of right ankle. Extensive œdema of subcutaneous tissues on right side of thorax, with some small bubbles of gas ; no œdema on left side. Pericardial sac normal. Abundant antemortem clot in both sides of heart, ventricles dilated ; no lesion in valves or coronary arteries ; muscle soft, œdematous, and pale.

Considerable effusion of serous fluid in each pleural cavity; nearly 2 pints in each. Lungs intensely congested and œdematous.

Small amount of serous fluid in the peritoneum Liver pale and markings blurred by cloudy swelling. Spleen not enlarged but congested and rather softened, Kidneys pale from cloudy swelling, but glomeruli intensely congested and visible as minute scarlet points in cortex. Suprarenals much congested. Some œdema of stomach and intestines.

Brain and its membranes intensely congested. Substance of brain generally, but specially region of optic chiasma, appears to be softer than normal.

Superficial wound 1 inch long on right hand involving skin. Wound over right ankle about 2½ in long, extending to bone on outer side; pus present, but no evidence of muscle necrosis or fracture. Wound on outer side of right upper arm immediately above elbow-joint, involving muscles on back, outer, and anterior aspects of arm, but no evidence of involvement of joint or bone Small fragment of metal, apparently part of a bomb casing, about 1 in. by ½ in. by ⅛ in., lying against lower end of humerus on outer side. Intense œdema of all tissues in this region, with small amount of pus at one point, but extensive necrosis of muscle fat, chiefly lower end of biceps and triceps and anterior part of the brachialis anticus Part of the muscle hæmorrhagic and completely destroyed, but beyond this large areas where muscle soft and unhealthy pale pink, characteristic of gangrene which has not yet reached stage of gas formation. Area of wound involves course of radial nerve.

Sections The most striking abnormalities were found in the lungs and brain, with less prominent changes in the liver, kidneys, and spleen. The histology of the local muscle lesion is described later.

Lungs showed generalised vasodilatation and consequent congestion, most marked in pulmonary arterial system and related capillaries. Many vessels appeared to be throm- [illegible] arterioles. Alveoli œdematous and contained enormous numbers of macrophage cells

Central nervous system Optic nerves completely demyelinated. In other parts of brain and spinal cord myelin degeneration could be demonstrated by Marchi's method; where myelin appeared normal, increase of doubly refractile material could often be demonstrated. These changes were patchy and there was no evidence of tract degeneration

Liver: Sinusoids and central veins dilated and tiny areas of central necrosis seen in some lobules.

Spleen: Vasodilatation well marked Sinusoids contained vast numbers of macrophages which could be seen ingesting red blood cells

Kidneys: Intense dilatation of venules Glomeruli larger [illegible] demonstrated in medullary vessels and in some glomerular tufts.

Bacteriology Heavy growth of *Cl welchii* and small number of unidentified clostridia (non gelatinolytic)

CASE 10.—Large scapular wound (left) leading down to compound fracture of head of humerus. Loose bone removed D [illegible] ar [illegible] P [illegible] fit [illegible] admission to QEH at 120 hr after wounding, 520,000 units. Temperature on the 7th day after wounding 101°, with maximum pulse-rate of 88. On 8th day arm was comfortable with temperature 99°, pulse 90

On 9th day, temperature 99°, pulse 80 Fracture reduced under general anæsthesia Wound of left scapular region, 6 in. by 3 in, involving infraspinatus muscle Wound looked very clean Swabbed with 'Cetavlon,' sewn up with penicillin tube, and 20,000 units instilled. Thoracobrachial plaster. On 10th day patient was complaining of pain caused by plaster cutting him at upper and lower margins. Sulphathiazole 6 g given Temperature 100 4°, pulse 124. For next 3 days temperature 100–101° Complained of pain under plaster, always temporarily relieved by various manipulative procedures Sulphathiazole 6 g daily continued

On 14th day, in view of persistent temperature and bacteriological report on swab taken at operation, showing chiefly penicillin insensitive organisms, plaster was taken down Much œdema extending on to deltoid and down to elbow and filling wound. On incision, infraspinatus muscle was purplish brown, infiltrated with blood-clot, and œdematous. No [illegible] Not excised. Dusted with [illegible] owder. Temperature 101°, [illegible]

On 15th day, at 1.15 AM, pulse 150, temperature 97 4°, respirations 20. Patient cold and clammy, sweating profusely, pulse barely perceptible; 3 pints of blood given with 66,000 units of AGGS and systemic penicillin. At 9.30 AM, patient no longer clammy, pulse 90, good volume; further 66,000 units AGGS given. At 10 30 PM plaster collapsed, making patient dyspnœic. Œdema noted round the umbilicus. Diffuse râles all over chest; respirations 30. On 16th day, at 2.30 AM, again became dyspnœic and bubbling, in which condition he remained until he died at 5.15 AM. Examination of wound showed gross œdema over shoulder, on to chest and lateral side of abdominal wall as far as iliac crest.

Autopsy carried out 6 hours after death with the following findings:

Well built young man, with penetrating wound extending from left upper arm through deltoid muscle, fracturing head of humerus and coming out through upper scapular region. No foreign bodies in track and no pockets of pus. Gangrenous muscle, 3 in. × 2 in., in region of wound (infraspinatus). Cardiovascular system: no obvious abnormality in heart. Respiratory system: about 3 pints of clear fluid in both pleural cavities; no adhesions; both lungs œdematous and showed subpleural hæmorrhages. Abdomen: patchy congestion of liver, spleen, and kidneys Brain and spinal cord sent intact for histology

Sections The local muscular lesion was essentially the same as that described later. Lesions [illegible] bled those found in case 10. [illegible] were common in the lungs, th [illegible] Alveolar œdema was well marked, and numerous "dust" cells were present Fat emboli were common, although not so numerous as in the other fatal case. Brain and spinal cord [illegible] nlarged and many [illegible] Cuboidal transfor [illegible], although it was no [illegible] nounced Damage to the distal nephron was promine [illegible] extreme dilatation of the venules was also observed.

Bacteriology · Moderate growth of *Cl. welchii* and gram negative diplococci.

SUMMARY OF TREATMENT

All the above cases were treated with systemic [illegible] cillin, 20,000 units intramuscularly every three [illegible] The average dosage in 9 severe cases was 1,050,[illegible] 11 moderate cases 1,700,000 units. In the ma[illegible] patients, 30,000–50,000 units of anti-gas-gangren[illegible] (BWCo) was given before operation. The therapeutic dose in the severe group was 100,0[illegible] and in the moderate group (including 7 cases who [illegible] antitoxin) 130,000 units.

TABLE I—COMPARISON OF HISTOLOGICAL AND [illegible] LOGICAL FINDINGS WHERE BOTH FORMS [illegible] TION WERE MADE

		Severe and fatal	Moderate	Mild
Bacteriology Histology	+ +	8	27	10
Bacteriology Histology	+ –	1	1	2
Bacteriology Histology	– +	1	3	6
Bacteriology Histology	– –	0	3	1

Laboratory Findings

HISTOPATHOLOGY AND BACTERIOLOGY

Histopathological and bacteriological examination [illegible] been used for determining the presence or absence [illegible] clostridial organisms. The results of these investi[illegible] tions in relation to our clinical groups are shown in tab[illegible] It will be seen that clostridia were shown to be present [illegible] the wound in all but 4 cases.

TABLE II—BACTERIOLOGICAL FINDINGS IN THE 72 CASES WITH SYSTEMIC REACTIONS

	Severe	Moderate	Mild	Total
Number of cases	11	41	20	72
Anaerobes				
Cl. welchii	8	31	9	48
Cl. œdematiens	..	..	..	..
Cl. septicum	..	..	..	..
Cl. fallax	..	2	1	3
Cl. sporogenes	2	7	2	11
Cl. butyricum	..	2	..	2
Cl. tertium	..	1	..	1
Cl. bifermentans	..	..	2	2
Cl. cochlearicum	1	4	1	6
Unidentified clostridia	1	2	..	3
Non-viable clostridia	3	2	1	6
Aerobes				
Proteus vulgaris	3	6	1	10
Coliforms	7	19	9	35
Diphtheroids	3	2	6	11
Non-hæmolytic streptococci	3	11	4	18
Enterococci	4	17	7	28
Gram-negative diplococcus	6	6	6	18
Ps. pyocyanea	1	6	..	7
β-hæmolytic strep. (group A)	..	1	1	2
,, (Sol. hæmolysin neg.)	1	4	2	7
Staph. aureus (coagulase-pos.)	2	2	1	5
,, (coagulase-neg.)	..	1	1	2
Staph. albus (coagulase pos.)	..	..	1	1
,, (coagulase-neg.)	3	5	5	13
Strep. viridans	..	6	2	8
Tetrads	1	6	..	7
Aerobic spore-bearing bacilli	4	14	8	26
Pathogenic clostridia not isolated	1*	9*	8*	18*

* This figure is arrived at by including as pathogens the clostridia which became non-viable on subculture and therefore could not be identified.

The histopathological findings may be further analysed. Approximately 120 muscle biopsies were examined from Service casualties. Adequate biopsies taken from various clinical groups revealed two distinct sets of histopathological changes. Both types of lesion showed a superficial zone of advanced necrosis of varying extent. In this area many varieties of bacteria, including clostridial forms, abounded, but no sign of vital reaction could be seen. Adjacent to this necrotic tissue in cases of the "mild" group there was an extensive zone of polymorphonuclear reaction amounting almost to suppuration. Beyond the suppurative band the muscle was congested and œdematous for a short distance, but the fibres themselves appeared to be comparatively normal.

In biopsies taken from patients who were seriously ill the initial zone of necrosis was precisely the same as that in "mild" cases, but there was only slight evidence of polymorphonuclear reaction in succeeding zones. In the area following the necrosis the muscle-fibres were widely separated, with alteration in staining reaction in many of them and degenerative nuclear changes in all of them. The endomysium was fragmented and the connective-tissue cells had disappeared. Some leucocytic pavementing of the endothelium was seen in capillaries where their walls had not been destroyed. The succeeding zone of muscle was intensely congested, with well-marked dilatation of capillaries and veins, and hæmorrhage from many of them. Thromboses were common, mostly of the ordinary fibrinous type, but conglutination of red cells was seen in many capillaries. Polymorphonuclear reaction was more pronounced in this region, but still scanty when compared with that occurring in pyogenic infections. In this area most of the fibres retained their striations, and only an occasional fibre showed the parboiled, unstriated condition described by Dunn and McNee (1917). The sarcolemma nuclei, however, almost invariably showed pyknotic changes, and many had disappeared. Hæmorrhage masked the interstitial tissue to a great extent. Congestion diminished gradually in the proximal muscle, but occasional isolated, unstriated, swollen fibres similar to those described by Dunn and McNee could be seen in muscle bundles which were otherwise healthy.

In the first lesion bacteria were confined to the zone of necrosis, and the leucocytic reaction appeared to be a barrier to invasion of the muscle behind. Bacteria of clostridial type could be seen growing in columns along the lines of the endomysial tissue as far as the zone of hæmorrhage in the second lesion, and in histological sections at least no other bacteria could be seen in this zone. It is this second lesion which has been taken to represent clostridial myositis. This diagnosis cannot be made in the first type of reaction, which is probably a potential case of the second. It is likely that the two conditions merge one into the other, but the histological material available has proved insufficient to do more than define these two possible phases in the process. It is also necessary to add that the term "clostridial myositis" has been used for obvious histopathological reasons, and is not necessarily synonymous with the clinical diagnosis usually termed "gas-gangrene." This clostridial myositis was found in both fatal cases, in 7 of the 9 cases of the "severe" group and in 18 of the "moderate" cases.

The results of the bacteriological examinations are shown in further detail in table II. It will be seen that the only pathogenic clostridia isolated were *Cl. welchii*, *Cl. fallax*, and *Cl. bifermentans*, and that of these *Cl. welchii* was the one most frequently recovered.

The complete absence of *Cl. septicum* and *Cl. œdematiens* from all the cultures was most unexpected. The state of anaerobiosis of the culture technique used was checked before and after the series of examinations was made, and showed that both *Cl. septicum* and *Cl.*

TABLE III—EXAMPLES OF HÆMOGLOBIN AND RETICULOCYTE FINDINGS IN CASES WITH SYSTEMIC REACTIONS AND OTHER CASES

Case		DAY													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
						CASES WITH SYSTEMIC REACTION									
8	Hb. %	57†	56	53	60	52	..	58	62	60	60†	72	..	..	72
	Ret. %	5·6	..	8·9	9·5	10·4	..	10·6	15·3	12·1	11·9	10·5	..	..	6·5
20	Hb. %	74	70	68	..	68	68	70	70	76	74	..	80	90	94
	Ret. %	4·5	9·0	6·0	..	5·5	7·5	10·3	9·5	8·4	3·2	..	..	8·7	5·4
23	Hb. %	90	..	50	56	58	.. ‖	84	90	96	..	..	..	..	..
	Ret. %	0·8	..	2·3	2·1	2·6	..	2·8	4·2	1·3	..	..	..	..	..
21	Hb. %	54	48*	58§	64	60	..	60	56	58§	82	84	84	80	82
	Ret. %	6·2	8·8	2·2	8·4	5·0	..	10·5	8·8	6·8	5·0	4·5	1·0	3·1	4·1
5	Hb. %	68	.. §	70	68	66	.. ‡	76	..	66	..	..	76	66	68
	Ret. %	1·8	..	3·3	3·0	2·7	..	2·2	..	0·7	..	..	0·6	1·2	0·3
						OTHER CASES									
A	Hb. %	62	62†	68	66	58	..	60†	78	82	90	86	..	..	..
	Ret. %	4·5	..	7·1	7·0	9·4	..	10·8	4·8	8·9	6·0	1·8	..	..	..
B	Hb. %	52	.. §	72	72	78	76	80	80	84	84	86	..	90	86
	Ret. %	9·4	..	11·6	9·8	7·7	6·9	9·0	7·2	4·8	4·6	3·6	..	5·0	3·4
C	Hb. %	56‖	86	70	70	70	72	..	..	..	..	..	..	82	..
	Ret. %	5·5	5·9	5·2	7·5	6·4	3·1	..	..	..	..	..	..	4·3	..

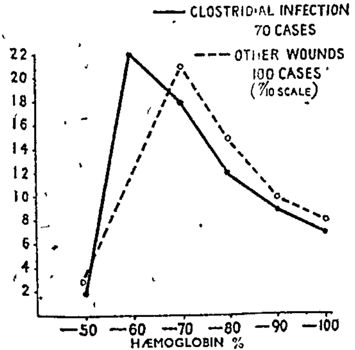
* [illegible]-transfusion 1 pint. † Blood-transfusion 2 pints. ‡ Blood-transfusion 2½ pints. § Blood-transfusion 3 pints. ‖ Blood-transfusion 4 pints.

œdematiens were viable under the conditions used. It should be pointed out that cultures specifically adapted [illegible]

did yield a growth, it was due to organisms other than *Cl. œdematiens*.

As regards the anaerobic flora, most of the infections appeared to be monomicrobic. In 3 cases the only organism isolated, either aerobically or anaerobically, was *Cl. welchii*. However, in 4 of the wounds three clostridia were present, and from 11 [illegible] were isolated. The associated aerobic cultural findings show the striking infrequency of pathogenic cocci. From only 2 of the wounds was *Strep. pyogenes* isolated, and *Staph. pyogenes* was found in only 5. The [illegible]-hæmolytic streptococci which failed to produce soluble hæmolysin were mainly those with the biological characters of group D, and were totally insensitive to 10 units of penicillin per c.cm.

The organism listed as a gram-negative diplococcus was most unusual. We believe that it is probably [illegible] report of our investiga- [illegible] moderate number of the cases, but all except one were sterile when examined under anaerobic and aerobic conditions. The septicæmia occurred in one of the cases clinically diagnosed as severe clostridial infection, but the organism isolated was a gram-negative diplococcus (? *D. mucosus*) with a viable count of 350 colonies per c.cm. of blood. It is interesting to note that this organism was insensitive to penicillin, that the blood was sterilised after 18 hours' intensive sulphathiazole therapy, and that the patient made a complete recovery.



Initial hæmoglobin in clostridial and other cases.

HÆMATOLOGY

The incidence [illegible] in 70 cases has been plotted in [illegible] the hæmoglobin readings [illegible] in 100 other wounded men have also been given; there does not appear to be any significant difference.

In all cases of the moderate and severe groups, hæmoglobin and reticulocytes were followed closely, and no profound drop in hæmoglobin was seen. As a rule, all cases with a hæmoglobin below 65% were transfused. In case 21 (table III), in spite of 4 pints of blood, little improvement was obtained; the man eventually developed infection with gram-negative bacilli, and only when this was cleared with proflavine-sulphanilamide dressing did the blood-count rapidly revert to normal. Reticulocyte-counts revealed a well-marked bone-marrow response, usually between 5 and 10%, not depressed by transfusion. In spite of this response, the hæmoglobin values tended to stay between 60 and 70% in the absence of excessive blood loss or suppuration. In only one patient (case 5) did the marrow appear to be [illegible] ore than 0·5–3% reticulocytes [illegible] values.

[illegible] e urine in most cases, though the serum-bilirubin at the onset, in those cases in whom it was estimated, did not show any well-marked incidence of raised values.

White-cell counts were done as a routine on the early cases of the series. Initial counts varied between 6000 and 30,000, the usual count being about 14,000 with 75% polymorphs. No significant finding was noted in the differential counts.

Hæmoconcentration, without the estimation of plasma volumes, is difficult to determine, but findings similar to case 23 in table III were noted in some cases—that is, a [illegible] operation with [illegible] e associated in [illegible] r of serial observations on the blood-counts in other types of wounds, there were many with similar hæmoglobin and reticulocyte findings, usually associated with heavily infected wounds.

BIOCHEMICAL FINDINGS

In the early cases of the series, blood was taken before operation at the time [illegible] se of antitoxin, or of taking [illegible] ng a 20 c.cm. syringe with [illegible] was not difficult to obtain the large quantities of blood necessary. The average findings in the group are given in table IV. No outstanding difference was detected, [illegible] lesterol, from the other [illegible] v, typical examples of [illegible] patients are given.

The ser [illegible] and 3) a [illegible] returned [illegible] health. A few cases, including one associated with a persistently positive flocculation reaction, remained below 100 mg. per 100 c.cm. during their stay in hospital. Though the majority of severely wounded and anæmic men had normal values, low cholesterol values were not specific for the cases with a systemic reaction. Low values were also found in cases of fat-embolism, and other

TABLE IV—BIOCHEMICAL FINDINGS IN PATIENTS WITH SYSTEMIC REACTIONS, COMPARED WITH THOSE IN OTHER WOUNDED MEN

	Systemic reactions (30 cases)			Other wounded (16 cases)		
	No. of obs.	Range	Average	No. of obs.	Range	Average
Spectroscopy	30	NAD	..	16	NAD	..
NPN	6	31–38	33	..	..	..
Blood-urea ..	30	32–62	41·2	16	34–60	47·4
Plasma pH units	30	7·3–7·48	7·38	16	7·21–7·51	7·30
,, CO_2-vols.%	30	43–62	55·2	16	41·5–59	51·06
,, NaCl ..	30	486–620	566	15	530–612	571
Serum sodium ..	29	278–345	321·3	15	280–315	318
,, potassium	23	14–25	20·6	12	10–25	18·8
,, magnesium	14	1·8–3·4	2·69	9	1·5–2·8	2·49
Plasma in. phosph.	27	2·0–5·0	3·31	14	2·5–4·0	3·31
,, ester phosph.	23	0·1–2·3	1·53	12	0·3–4·2	1·49
,, lipoid phosph.	22	6·3–28·3	11·06	12	5·7–12·7	9·48
,, albumin ..	30	3·4–4·6	3·67	14	3·0–4·6	3·97
,, globulin ..	30	1·7–2·85	2·73	14	1·63–3·9	2·46
Serum bilirubin	27	0–3·8	0·40	11	0–1·3	0·30
,, calcium ..	10	8·2–11·7	9·88	10	9·2–10·5	10·07
Cholesterol ..	24	40–92	65·5	16	57–207	116·0

Units in mg. per 100 c.cm. except where otherwise stated.
NAD = No abnormalities detected.

TABLE V—BIOCHEMICAL FINDINGS BEFORE OPERATION (SEVERE AND MODERATELY SEVERE)

	Case							
	12	13	3	14	2	11	15	8
Spectroscopy ..	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD
NPN	31	..	..	..	..	..	..	..
Blood-urea	41	31	46	51	57	57	60	51
Plasma pH units ..	7·40	7·31	7·31	7·38	7·38	7·45	7·46	7·36
,, CO_2-vols.%	54·5	43·5	43	50	52	51	54	57
,, NaCl ..	517	557	551	560	580	500	504	597
Serum sodium ..	303	300	352	316	311	..	288	297
,, potassium ..	21·0	16·0	..	21·0	17·5	..	17	15
,, magnesium ..	2·0	1·8	..	2·9	2·9	..		
Plasma in. phosph. .	5·0	3·8	4·2	3·1	3·3	..	3·0	2·0
,, ester phosph.	0·9	1·2	1·4	1·9	2·1	..	0·1	0·2
,, lipoid ..	9·6	10·8	10·0	9·4	9·5	..	[illegible]	7·2
,, albumin ..	3·5	4·3	4·6	[illegible]	3·4	3·9	3·4	4·3
,, globulin ..	2·6	1·7	2·77	1·9	2·2	1·45	2·4	2·1
Serum bilirubin ..	0	0·7	0	0	0	..	..	0
,, calcium ..	..	9·9	..	9·7	9·5	..	[illegible]	..
,, cholesterol ..	82	77	49	72	100	62	73	92
Hæmoglobin % ..	54	82	72	66	68	104	58	57

Units in mg. per 100 c.cm. except where otherwise stated.

types of wounds. In cases with low cholesterol, anæsthesia would restore the values to normal temporarily.

The outstanding feature of the urinary findings was the high total nitrogen. In table VI are given 8 examples. The creatinine, creatine, and urea would seem to account for the nitrogen output.

TABLE VI—EXAMPLES OF URINARY FINDINGS IN CASES WITH SYSTEMIC REACTIONS

	Case							
	21	12	6	22	15	18	20	3
Vol. (c.cm.) ..	1895	1600	1530	1460	2220	2460	1200	1420
Urea % ..	(2·0)	(2·2)	..	(2·7)	(1·9)	(2·4)	(3·04)	(4·3)
Microscop. ..	NAD	..	..	..	..	..	..	Red cells
Creatine (mg.)	1990	2750	2865	905	2570	1707	1762	1450
Creatinine (mg.)	1412	1486	2238	1719	2220	1930	1230	1890
In. phosph. (g.)	0 6	0·99	2 18	1·49	1·68	1·89	1·32	0·82
Total phosph. (g.)	1·06	1·4	2·55	1·72	1·74	2·03	1·43	0·98
Potassium (g.)	1·55	2·56	3·4	3·3	3 3	2·46	3·16	6·6
Urobilinogen ..	1/10 +	1/10 +	1/20 +	1/10 +	1/10 +	–	1/10 +	1/10 +
Urobilin .	+	++	+	++	+	–	±	+
Total nitrogen (g.)	18·6	18·1	27 9	18·4	25·2	30·5	19·4	27·2
Total chloride (g.)	0 25	0·27	1·07	1 82	2·4	4·1	0·62	4·7

Almroth Wright (1917) considered acidosis to be a consequence of severe clostridial infection. In any severely wounded man, however, profound upset takes place in electrolyte balance. Renal function may be temporarily changed as in shock, or more permanently damaged as in cortical necrosis (Jeffreys and Scott Thomson 1944) or the crush syndrome (Bywaters and Dible 1942). With this impairment of renal function further upsets of electrolyte balance may take place, with the consequent production of acidosis. As will be seen in table IV, mild degrees were frequently seen in all types of wounds.

A further factor in producing changes in electrolyte balance is hyperpnœa associated with moderate degrees of fat-embolism. seen in both severe clostridial infections and fractures. Furthermore, a primary CO_2 deficiency, which might be due to hyperpnœa, may be followed by a secondary compensatory change in blood bicarbonate to readjust pH. The pH values in our cases, even in those with low CO_2 values, are relatively normal. The issue is also complicated in these cases by the fact that sulphanilamide inactivates carbonic anhydrase (Hartman 1939. Mann and Keilin 1940).

FLOCCULATION REACTION

The technique used for the flocculation reaction has been described in our previous paper. Of 148 sera examined. 36 were strongly positive, 29 incompletely positive, and the remainder negative. In all but one case the reaction became negative as the other signs of systemic reaction disappeared. This flocculation reaction cannot be regarded as in any way specific for clostridial infection, and its significance is still obscure.

Discussion

It is clear that the systemic reaction in all our series of 76 *cases cannot necessarily be attributed to the effects* of clostridial toxins. These were, however, almost certainly a major factor in the two fatal cases (cases 10 and 11), and it seems possible that they played some part in the systemic reactions in the 7 severe cases and 18 moderate cases. in which the histopathological picture was one of clostridial myositis. In the remaining cases it seems likely that the part played by the clostridia in the production of the systemic reaction was negligible.

Clostridial toxins might cause systemic reactions either by the direct action of circulating toxin on the body tissues and fluids or indirectly through the liberation of tissue breakdown products from the site of infection. In the former case it would be expected from our experimental studies that circulating toxins might cause severe hæmolysis, flocculation of chylomicrons, splitting of plasma lipoprotein complexes, or visceral changes, such as demyelination in the central nervous system. If the indirect mechanism is involved. then some evidence of liberation of breakdown products must be sought—of these, fat is one with which we have been particularly concerned, and which is relatively easily demonstrable. With these general considerations in mind, our observations may now be reviewed with special reference to the two fatal cases.

Clostridial infections in man have long been recognised as associated with severe anæmia (Klotz and Holman 1911. MRC Report 1919, Henry 1919, Nikolskaya 1943, MacLennan 1943). Filtrates of *Cl. welchii* are hæmolytic in vitro and in vivo (Bull and Pritchett 1917). Gordon and colleagues (1940) showed that type A *Cl. welchi* toxin produced a rapid fall in red cells, while in type I there was a progressive rise in hæmoglobin concentration In some of our cases there was a well-marked bone marrow response with relatively stationary, or decreasing hæmoglobin. We did not obtain adequate data on th serum-bilirubin, but there was an increased excretion c urobilin in these cases. It is possible that this ma indicate increased blood destruction, in the absence o any obvious source of blood loss. Similar findings hav been found in non-clostridial infections and have also bee described associated with other types of fat-embolisn (Sophian and Scharles 1938, MacLachlin, Harris, an Perrett 1939). Cholesterol prevents the action of man hæmolytic agents in normal blood (Schulman and Ridea 1937), and it is possible that the low blood cholesterol found in these cases may be significant in this connexion It may be concluded that severe hæmolytic anæmia such as might be caused by circulating lecithinase, was no a feature in any of our series, even in the severe and fata cases.

Flocculation of chylomicrons is readily caused b *Cl. welchii* lecithinase (Elkes and Frazer 1943), an the reaction is entirely prevented by specific antitoxin The sera from many cases in the severe group also caus flocculation of these fat particles, but the reaction is no regularly preventable with antitoxin, nor is it specifi for clostridial infections, Whatever may be the caus of this reaction, it cannot be attributed to the presence o circulating *Cl. welchii* lecithinase. With regard to th splitting of plasma lipoprotein complexes. it is impossibl to demonstrate this reaction (Nagler) with sera from an of our cases, although it will occur with a toxi concentration much less than that required to produc flocculation of chylomicrons.

Demyelination in the central nervous system has bee demonstrated in our two fatal cases. In one of thes blindness occurred before death. and extensive demyelination of the optic nerves was demonstrable at autopsy We have no evidence of neurological lesions in any of th other cases. Demyelination can be produced experimentally in animals after injection of toxins. but it is no comparable in degree to that seen in case 11. Furthe investigation is required before these changes can b safely attributed to a direct action of clostridial toxins.

Extensive fat-embolism involving the lungs and othe organs was demonstrable at autopsy in both our fata cases. one of which had no fracture. Similar finding have also been obtained in a case of clostridial infectio of the bladder. not included in this series, where neithe wound nor fracture was involved. Fat-embolism can b demonstrated experimentally following the injection o clostridial toxins into guineapigs and rabbits. The diagnosis of moderate degrees of fat-embolism is difficult i cases which survive, but a raised respiration-rate wa present in all the severe and many of the moderate group Dry cough was often present. sometimes associated wit pleuritic pain. One case had a mild purpuric rash Three cases developed bronchopneumonia, and in one o these the sputum was examined for fat and showe abnormally large fat globules. It is not impossible tha some of these symptoms were due to fat-embolism.

Though the occurrence of fat-embolism has been know for many years. it was regarded as a pathological rarity until recently (Robb-Smith 1941, Rowlands and Wakeley 1941), many fatalities in which fat-embolism may have been an important factor being attributed to heart-failure, pneumonia, pulmonary embolism, concussion, coma, or uræmia (MRC Report 1940, Lemner 1940, Jeffrey and Scott Thomson 1944).

The embolic fat in clostridial infections in man may be derived from the site of infection and from the blood fat—in either case it must be regarded as an indirect effect of the clostridial toxins. As described in our first paper, the fat-embolism in guineapigs can only be derived from the site of toxin injection.

From the limited number of our clinical observations, and in view of the fact that we have particularly studied the effect of the *Cl. welchii* toxin lecithinase on certain lipoid tissue elements, and have not investigated the action of other components of this toxin, it is impossible to come to any conclusions on the nature or ætiology of systemic reactions in clostridial infections, but we may perhaps indicate certain possibilities.

The balance of evidence presented suggests that the products of tissue breakdown may be a more important factor in the systemic reaction than circulating toxin. This would be in accord with the difficulty experienced by me [illegible] dial toxins in the [illegible] might also accou [illegible] emic reac- tions [illegible] ases, since tissue [illegible] ne import- ance [illegible] might be the great increase in the extent and speed of tissue [illegible] excluded.

Such a conception of the nature of the systemic reaction in clostridial infections would lend support to the view that adequate surgical removal of necrotic muscle from the wound is the most vital measure in treatment of the systemic reaction. The lack of dramatic effect with antitoxin would be expected if breakdown products are largely responsible for the systemic reaction, but antitoxin given early and in large doses might have some protective effect, since it prevents the breakdown of tissues by clostridial toxins in vitro. It is clearly impossible to attempt any assessment of the value of chemotherapy in these conditions from this small group of cases, but it seems probable that their efficacy will be limited in the absence of adequate surgery.

Summary

From a series of 2680 wounded men from the Western Front a group of 76 cases with systemic reactions have been studied. All but 4 of this group showed evidence of clostridial organisms in their wounds. It is suggested that this group consequently includes the majority of true and potential "gas-gangrene" cases.

The group has been further subdivided on the basis of the severity of the systemic reaction into four sections of increasing severity, the last consisting of 2 fatal cases.

The 2 fatal cases, 7 of the severe, and 18 of the moderate group gave a histopathological picture of clostridial myositis.

Possible signi [illegible] were low blood [illegible] Acidosis did no [illegible] in other wounded men.

While the hæmatological studies showed evidence of a hæmolytic process in some cases, severe hæmolysis was not a feature in any case.

Flocculation of chylomicrons occurred in a number of cases, but this is not specific for clostridial infection, nor can it be attributed to the direct action of clostridial toxins.

At autopsy in the 2 fatal cases extensive fat-embolism of the lungs and other organs was demonstrated and demyelination was found in the central nervous system.

The possible relationship of the clostridial infection to the systemic reactions described is discussed.

We are indebted to the honorary and whole-time surgical staff of the Queen Elizabeth Hospital, and to Prof. Haswell Wilson for their coöperation, and to Major J. D. MacLennan, RAMC, for valuable criticism. We also wish to thank Dr. Margaret Thompson for her help in the collection of clinical data and Mr. J. Parkes, AIMLT, for technical assistance.

References at foot of next column

ATYPICAL PNEUMONIA

R. W. D. TURNER, MD CAMB., MRCP
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PRIMARY atypical pneumonia, virus pneumonia, or pneumonitis has only been described during the past nine years; but there is no reason to suppose that this infection is of recent appearance, and much clinical evidence suggests the contrary. The greater number of [illegible] y be due to an actual [illegible] due to more thorough [illegible] of atypical pneumonia [illegible] past it has not been customary to examine the chest radiologically in cases of influenza or fever of unknown origin unless the infection failed to clear up or some other pulmonary condition or complication was suspected. If the blood was examined at all, a normal white count did not lead to an X-ray examination of the chest unless pulmonary tuberculosis was to be excluded. In the present series, these two investigations established the diagnosis on a firm basis and prevented unnecessary and possibly harmful [illegible] nd abolishing [illegible] of 286 cases in British Service men in Italy during the first 8 months of 1944. All degrees of severity were encountered. Reading through the case-sheets makes it obvious that many cases were missed before the condition was clearly recognised. With increasing experience we were convinced that many formes frustes of the infection, without actual pneumonia, were occurring and formed one group of the inevitable "pyrexias of unknown origin." During this period cases of pneumonia were diagnosed as follows:

Pneumonia, atypical	286 cases
Pneumonia, bacterial	57 ,,
Pneumonia, ? type	21 ,,

CLINICAL PICTURE

The patient's general appearance did not resemble that seen in bacterial pneumonia of corresponding severity. It is true that in the years before the war the picture of pneumonia seer [illegible] once familiar chart of about [illegible] by [illegible] in [illegible] bacterial pneumc [illegible] the end of the bed and by the sister in charge. The characteristic picture of a man, propped up in bed, with dry skin, difficult gruntii [illegible] rusty sputum was to be expected.

This picture was in striking contrast with that of the far more common atypical pneumonia, in which the patient might be ill and have the symptoms associated

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DR. COOKE AND OTHERS: REFERENCES

Bull, C. G., Pettit [illegible]
[illegible] (1916)
[illegible] 60.
[illegible] 884
[illegible] ry 110.
[illegible] ll. D. er
[illegible] 46.
Williams, [illegible] Lancet, i, 1.

with high fever, but the breathing was easy, there was no special desire to be propped up, and there was little or nothing to attract attention to the chest. After some days or perhaps a week or more, careful daily search was usually rewarded by finding the characteristic crepitations. Sometimes these signs did not appear, and often one was astonished at the extensive X-ray shadow. On going back to examine the chest after seeing the X-ray films one still failed to find more obvious signs and we learnt not to be humiliated.

High fever at the onset (104°–105° F), persisting without swing for 7–10 days and then falling gradually, was the familiar picture in a case of average severity, but, as has been said, all degrees of the infection were seen and the temperature chart varied accordingly; no case fell by crisis. The pulse-rate varied with the individual response, but on the whole tachycardia was definitely less than with corresponding fever in bacterial pneumonia. The respiration-rate was also less raised.

SYMPTOMS AND SIGNS

Malaise, shivering, sweating, and anorexia were the commonest early symptoms, followed by headache, general aches, and dry cough. An actual rigor was rare. Headache may be very intense and accompanied by sufficient neck rigidity to warrant lumbar puncture. In such cases there may be delirium too. Anorexia may be as complete as in infective hepatitis. Upper respiratory catarrh was never a well-marked feature, and in fact was usually absent. Cough was also often absent in the early days, gradually becoming more pronounced and then productive of characteristic sputum, until it became obvious that one was dealing with a chest case. Sometimes persistent dry cough was a distressing feature. Pleural pain did sometimes occur; more often the patient complained of a dull ache in the affected part of the chest, but usually there was no pain at all.

The characteristic sputum in our cases was a blood-stained mucoid jelly, and this is noteworthy because in other series blood-staining is not specially mentioned. Moreover, now and again frank hæmoptysis of pure blood was seen. As might be expected the laboratory did not find any predominant organisms and usually reported a mixture of the customary flora of the mouth. Later on in the disease there may be admixture with purulent material from secondary infection. The sputum did not resemble that of influenzal pneumonia, nor that usually seen in bacterial pneumonia. Mucopurulent sputum in these cases may be accounted for by the fact that the alveolar exudate becomes mixed with the sputum from an accompanying purulent bronchitis. This view is supported by the physical signs in the chest and by the autopsy findings described by Longscope[1]—the alveoli were filled with a loose exudate consisting of coagulated serum, red cells, and many mononuclear cells; polymorphs were almost entirely absent from the alveolar exudate but might fill the bronchioles or bronchi.

Herpes labialis was seen in only a few cases. The spleen was frequently palpable during the febrile stage. The blood-sedimentation rate was raised to the degree that might be expected, and is of no special value except possibly as an additional guide to convalescence.

Physical signs in the chest.—The characteristic sign is the appearance of an area of persistent crepitations, usually heard at one base or in the axilla. These crepitations are neither very fine nor very coarse and are perhaps best described as "sticky." They were rarely present until several days had passed—sometimes not for as many as 10 days—and tended to last well into convalescence. Sometimes impaired percussion note and decreased air entry were found. Occasionally bronchial breathing or frank signs of consolidation appeared. This may indicate some degree of secondary infection, in that these added signs were sometimes accompanied by a rising white-cell count (10,000–12,000 per c.mm.) and an increasingly purulent sputum. Evidence of bronchitis (diffuse rhonchi) was common, especially in the early stages, though clinically it was never thought to be sufficient to account for the severity of the illness.

INVESTIGATIONS

Of the 286 cases, an X-ray examination of the chest and white blood-count were done in 129, an X-ray examination only in 39, and a white count only in 30 cases.

White blood-count.—During the febrile stage, the white count is essentially normal. In 90% of cases it was between 4000 and 10,000 per c.mm. Of the few instances in which it was over 10,000, in only 3 was this during the first week, and in the remainder sputum had become semi-purulent or an effusion had developed. This investigation is therefore of great importance in differentiating from bacterial pneumonia and as a guide to treatment. The differential count is variable and of no assistance. In cases of bacterial pneumonia, which were being treated at the same time, the white count was consistently between 15,000 and 35,000.

The initial white count in 159 cases were as follows: in 23 cases the count was repeated and in 18 of these was still less than 10,000 per c.mm.

White cells (thousands per c.mm.)	2–4	4–6	6–8	8–10	10–11	11–12	12–13	13–1
No. of cases	3	46	50	47	9	2	1	1

X-ray examination of chest.—The characteristic X-ray finding is an opacity disproportionately greater than would be expected from the physical signs, not of lobar distribution, and of uniform density resembling ground glass or a fine hazing. The shadow may be of any size, often vaguely outlined and irregular, and occasionally circumscribed. It may occur in any part of either lung or be multiple or occasionally migratory. A diagnosis of primary atypical pneumonia can usually be made from the film, but not always, because a patchy dense opacity like that seen in bronchopneumonia is sometimes seen. Differentiation from bacterial pneumonia can then only be made by the absence of leucocytosis and failure to respond to chemotherapy. When the opacity is situated in the upper zone, diagnosis from pulmonary tuberculosis may be impossible without serial films. The shadow may persist long after the patient has clinically recovered. Several cases were sent to us for evacuation to the United Kingdom as having unresolved pneumonia but cleared completely in two to three weeks more.

When cough is not a prominent symptom and there are slight or no abnormal signs in the chest, an X-ray examination is invaluable. The characteristic picture is presumably formed by the coagulated serum in the alveoli. The radiological distribution of opacities in 168 cases was as follows:

Zone affected	R. lower	L. lower	R. upper	L. upper	R. mid.	L. mid.	R. multiple	L. multiple	Mixed L.&R.
No. of cases	42	31	18	9	12	13	12	14	17

DIAGNOSIS

Diagnosis on clinical grounds may be extremely difficult and constituted a real problem, but it was made easier for us because during most of this period of the year malaria was almost confined to benign tertian relapses, the short-term summer fevers such as sandfly had not begun, and infective hepatitis with a preliminary febrile stage had become rare. The less common fevers which were occurring, such as brucellosis, amœbiasis, and kala-azar, can rarely be diagnosed in the first 10 days anyway.

In many instances the chart closely resembled that seen in typhoid fever, as did the white count, and to make matters more difficult some cases had crops of "rose spots" on the trunk. At this time non-specific rose spots were occurring in other infections, including malaria. The subsequent course revealed the diagnosis but some were fully investigated to exclude such infection. At this time there was no epidemic of cases compatible with a diagnosis of influenza. It is true that early on some of the patients were so labelled and we were fortunate in having Major Stuart-Harris admitted in March (with an atypical throat!) and his observations on this point were most helpful. Bacterial pneumonia was occurring too, but the general picture, sputum, and high leucocytosis served to differentiate it.

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[1] Longscope, W. T. *Practitioner*, 1942, 148, 883.

The chief point in diagnosis is that even though there does not appear to be "much in the chest" in patients with high fever for no obvious reason, any degree of cough and even scanty signs in the lungs should lead to an X-ray examination and a white count being carried out before chemotherapy is started.

COURSE

In many cases high fever of 104°–105° F persisted for 8–10 days and then fell by lysis. The chart in an undiagnosed patient can be frightening, but if the diagnosis has been made and confirmed by a normal white count, confidence is justified and any further temptation to give sulphonamides should be resisted. It must be mentioned that occasional deaths have been published elsewhere. In moderately severe cases the fever falls to 102°–103° by the third to fourth day and to normal by the sixth to ninth day. In a few instances fever persisted for 2–3 weeks.

Secondary infection in the sense of a bacterial pneumonia or some septic complication following the original illness was not seen. There is certainly a tendency for the white count to rise a little as the condition progresses, but this may be the normal reaction to the original infection. An increasingly purulent sputum and white count of 10,000–12,000 sometimes followed although fever had subsided.

Complications.—Convalescence tended to be rapid and complications were rare. Pleural effusion occurred in some cases and is discussed below. Some men were seriously ill but none died. Relapses were rare. Secondary infection was only [illegible] white count and not by the [illegible] cases developed a transver[illegible] to the (presumed) virus of atypical pneumonia, or perhaps to the lighting up of a separate latent virus.

Treatment shou[illegible] needed in sever[illegible] indicated but the [illegible] It is difficult to [illegible] harm but certainly the patients feel and look worse with sulphonamides, and seriously ill men recover satisfactorily without them. Sulphadiazine, sulphathiazole, and sulphapyridine were tried in full dosage and proved valueless. In cases which develop an effusion it may be wise to give a course of some sulphonamide preparation with a view to preventing an empyema.

Ætiology.—There was little opportunity for investigating the ætiology. Blood-cultures were sterile. No unusual organisms were isolated from the sputum. No animals were available for virus inoculation tests. Serological studies for antibodies were not practicable. However, an attempt was made to show the presence of cold-agglutinins for group "O" cells. Captain Robins of the US Army Pathological Service kindly co[illegible]ases in US patients. Th[illegible] In only 1 out of 30 [illegible]veral controls gave doubtful results. No member of the medical or nursing staff developed the infection, nor did any patient admitted to hospital for some other disease. This suggests low infectivity once the disease can be recognised. Cases of infection of the respiratory tract admitted during the same period were as follows:

[illegible]	639	Pneumonia, bacterial Pneumonia, ? type	107
[illegible]	227	Pneumonia, primary atypical	286
[illegible]	28		
[illegible] effu[illegible]	10		

It will be appreciated that only cases of upper respiratory tract infection severe enough to warrant admission to hospital under Service conditions are included, whereas most cases of primary atypical pneumonia are probably sent to hospital. As has been suggested, however, it seemed certain that many minor degrees of the infection without actual pneumonia were occurring.

PLEURAL EFFUSION

The number of cases developing fluid is interesting because little seems to have been published on this subject. In the present series there were 11 cases of undoubted primary atypical pneumonia which developed an effusion. There may well have been more, but owing to pressure of work in the specialist departments not all of the patients were sufficiently investigated in the pneumonic stage to be sure of the type of infection present. A number were admitted having already been diagnosed as pneumonia and put on chemotherapy, so it was impossible to tell if a subsequent pleural effusion might not be an aborted empyema following a bacterial pneumonia. Only those cases have been included in which evidence for the primary condition seemed convincing. During the period under review there were 33 cases of pleural effusion of all types:

Primary pleural effusion	10	Pneumonia: type	8
Pneumonia, primary atypical	11	Empyema, postpneumonic	1
Pneumonia, bacterial	3		

In 5 of the atypical pneumonia cases the effusion was small and left to absorb without paracentesis. In 5 cases in which the fluid was examined, 4 had yellowish green semi-opaque sterile fluid, and one a blood-stained sterile fluid. Some examples of pleural effusion in atypical pneumonia follow:

CASE 1.—Age 33. Gradual onset over 10 days. Admitted severely ill. Temperature swinging up to 105° F. Cough with blood-stained mucoid sputum. Characteristic crepitations left lower lobe with dullness at extreme base. Next day (11th) X ray showed atypical pneumonia left lower zone with small pleural effusion. White cells 6650 per c.mm. Signs of effusion increased. Second X ray showed large effusion. On 18th day, 13 oz. of clear yellow fluid were removed. Fluid showed occasional lymphocyte and monocyte; no organisms; sterile. Patient remained very ill for the next fortnight and continually brought up very blood-stained sputum. He was given 55 g. of sulphadiazine in case he developed an empyema. On 23rd day, white cells 13,450, on 27th day 7000, on 33rd day 8000, and on 38th day 6900 per c.mm. On 32nd day chest was tapped again and similar fluid found. Sputum repeatedly negative for tubercle bacilli. He then slowly improved and was given a prophylactic course of sulphadiazine. Afebrile by 48th day. On 58th day X ray showed resolving pleural effusion and consolidation of underlying lung. By 75th day evacuated home much improved. Effusion absorbing well.

CASE 2.—Age 28. Admitted after 7 days' malaise and shivering. Few signs in chest but diminished air entry and impaired note at right base. Three days later, when still febrile, white cells 6400 per c.mm. X ray showed area of consolidation at right base with small pleural effusion. Normal recovery. No paracentesis; no chemotherapy.

CASE 3.—Age 21. Onset with headache, malaise, shivering, and sweating. Temperature 103° F. Pulse-rate 120 per min. No signs in the chest by 4th day, but pain right lower chest and dry cough. X ray showed patch of atypical pneumonia. White cells 5800 per c.mm. Then developed signs of fluid. Second X ray on 12th day showed considerable effusion (right) with conso[illegible] Yellow translucent fluid aspir[illegible]acilli. Prophylactic course of [illegible] given. Fluid gradually absorbed. Sent to convalescent depot on 57th day and reviewed a month later as outpatient. Well; chest clear; X ray normal except for thickened right basal pleura.

CASE 4.—Age 29. Onset of malaise and left pleural pain. Admitted 4th day. Temperature 103·8° F. Pulse-rate 88. Blood-stained sputum. Rub and crepitations at left base. On 6th day, temperature 104°–105°; white cells 8300 per c.mm.; signs of patch of consolidation left lower lobe, and multiple crepitations left lower lobe; seriously ill; course of sulphadiazine begun. On 10th day temperature still 103°; X ray showed consolidation of whole of left lung. On 12th day consolidation spreading to right side; very ill; white cells 12,600; sputum, no spo[illegible] bacilli. On 14th day, X ray [illegible] zones of left lobe and small rig[illegible] day, delirious, very ill [illegible] temperature 101°; [illegible] X ray showed consolidation [illegible] clear; improving; sputum becoming purulent; gradual resolution; no paracentesis. Afebrile by 26th day. Began to sit up on 36th day. Chest clear. Normal convalescence.

SUMMARY

The purpose of this paper is to encourage a more widespread recognition of primary atypical pneumonia.

A clinical description is given based on the study of 280 cases in Service men.

Diagnosis may be impossible without accessory methods of investigation. The importance of the X-ray findings and the white blood-count is explained:

Chemotherapy is contra-indicated.

An account is given of 11 cases complicated by pleural effusion.

My thanks are due to the members of the medical division and the staff of the X-ray and pathological departments of the hospital for their help with the cases, and to Colonel W. J. F. Craig for permission to publish this report.

DISTRIBUTION OF SULPHAMEZATHINE IN THE BODY-FLUIDS

RELATION TO CRANIAL INJURIES

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SULPHADIAZINE has been much used in the prevention and treatment of intracranial infections. It has been especially useful after compound fractures of the skull with penetration of the dura, particularly if the patient cannot immediately be given surgical treatment. The effectiveness of the drug is probably due to the ease with which a high concentration can be produced in the cerebrospinal fluid (CSF). The CSF level is usually 60–80% of that of the blood—a higher percentage than for any sulphonamide, other than sulphanilamide itself. Unfortunately, owing to the insolubility of sulphadiazine, patients receiving this substance may show crystalluria, hæmaturia, renal colic, obliguria, and even urinary suppression with uræmia. The tendency to these complaints is increased by dehydration and the acid urine commonly seen in warm climates, and is decreased if fluids and alkalis are given in large amounts (Peterson et al. 1943). Other sulphonamide derivatives are being continually investigated in the hope of finding one of equal potency without this tendency to precipitate in the urinary channels. Two derivatives of sulphadiazine have attracted attention from this aspect. Sulphamerazine (monomethyl-sulphadiazine) has been studied in the USA (Hageman et al. 1943), and sulphamezathine (dimethyl-sulphadiazine) has been used in this country.

The great solubility of sulphamezathine and its sodium salt led us to use these drugs in cases of head injury. The Medical Research Council memo on the sulphonamides (1943) gives the solubilities of the free drugs in mg. per 100 c.cm. as:

	Water at 37° C	*Urine at 37° C*	
		pH 5·5	pH 7·5
Sulphadiazine ..	15 ..	18 ..	52
Sulphamezathine ..	190 ..	191 ..	297

This indicates that appreciable quantities of sulphamezathine can be excreted in the urine without fear of precipitation, and that the reaction of the urine is less important than it is in sulphadiazine therapy.

In this study, 67 patients received sulphamezathine in doses of 6–18 g. in 24 hours. The total quantity was in each case divided into doses given 4-hourly. The intravenous and oral routes were used, but doses of 18 g. daily were always reduced after 3 days. In nine patients estimations were done (by method of Bratton and Marshall) of the free and total sulphonamide in blood, lumbar CSF, and urine at intervals throughout the treatment. (In one case the ventricular fluid level was found to be the same as that of the lumbar fluid.) Control experiments showed that the use of 'Novocain' for spinal puncture, and the systemic or intrathecal administration of penicillin, had no ole effect on the results.

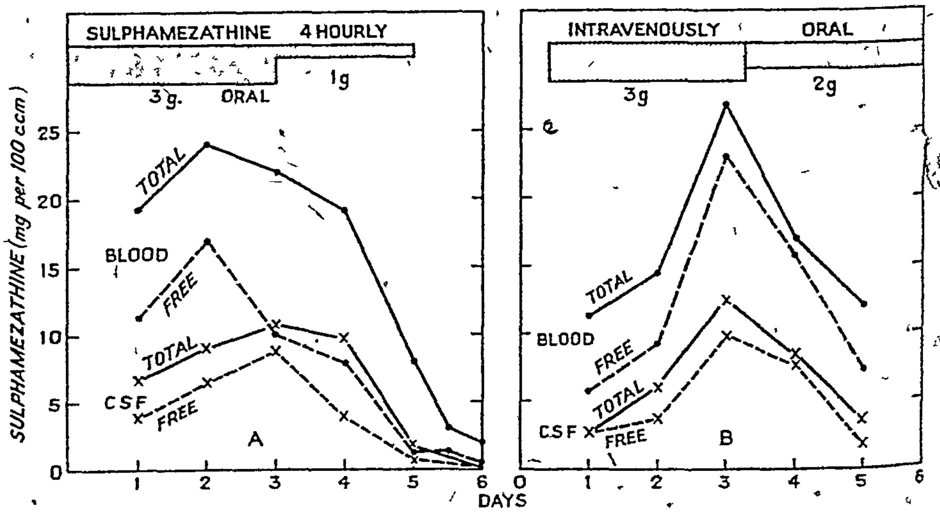

Fig. 1—A and B. Typical variations in sulphamezathine levels in blood and CSF, with 4-hourly administration by mouth or intravenously.

RESULTS

During the investigation no toxic symptoms were found. There has been nothing more than occasional nausea, and no vomiting. There were no drug rashes, drug fever, or blood changes. In spite of the high urinary concentration there was no hæmaturia, renal colic, or oliguria, whatever the reaction of the urine.

The regularity of the results justified the drawing of conclusions from this small series of estimations. Fig. 1 (A and B) shows the variation of the sulphamezathine level of blood and CSF in two typical instances, and fig. 2 shows the effect on blood and CSF of a single large intravenous dose.

DISCUSSION

A high blood-level of sulphamezathine is readily obtained in oral therapy; apparently absorption from the intestine is rapid. Excretion is almost as rapid as absorption, for it is impossible to maintain a high level on a reduced dosage. Twenty-four hours after the administration of the drug is stopped there are only traces in the blood, and the urinary concentration has fallen greatly. There does not appear therefore to be any retention within the body of this drug as there is of sulphadiazine, the excretion of which may continue for three or more days after the last dose.

The concentration of sulphamezathine in the lumbar CSF does not correspond with that in the blood. Very rarely does the CSF concentration exceed 50%, and more often it is about 40% of the blood concentration. The passage of the drug from the blood to the CSF is not affected by frank meningitis.

The rapid rate of acetylation is shown by the blood changes caused by a single dose (fig. 2), when an appreciable quantity of the acetylated form is found half an hour after administration. In both the blood and the CSF a high proportion of the drug is in the inactive acetylated form. In the urine 60–80% is acetylated.

It is interesting to compare the solubility and CSF partition of sulphadiazine and its two methyl derivatives. The solubility and rate of acetylation increase with addition of the methyl groups (Clark et al. 1943, Welch et al. 1943), but the ease of passage from blood to CSF decreases. This blood-brain barrier is probably related to the degree to which the drugs are bound to protein. It has been shown (Gilligan 1943) that 50–60% of sulphadiazine, and 70–80% of sulphamezathine in blood is bound to the plasma proteins, and, according to Davis (1943), only the unbound form can reach the CSF. It is surprising that the more protein-bound of the two drugs is also the more rapidly excreted in the urine; perhaps the greater solubility outweighs any hindering effect of the protein-binding.

In assessing the value of the drug for treatment of head injuries, it is important to know the absolute concentration of the free drug in the CSF which can be produced by a given dose. The bacteriostatic effects in vitro of sulphadiazine and sulphamezathine are about the same (Gilligan 1943); and for sulphadiazine the clinically effective concentration in CSF is 10–15 mg. per 100 c.cm. (Sako et al. 1942). In this work it was impossible to maintain such concentrations, and since our patients were being given penicillin at the same time we could not tell whether the low CSF concentrations of sulphamezathine were having any effect.

In general, this study confirms the recent work on sulphamezathine by Clark and others (1943), who also [illegible] tion. From [illegible] of the free [illegible] was readily diffusible into the CSF; this conclusion is not justified by their published figures

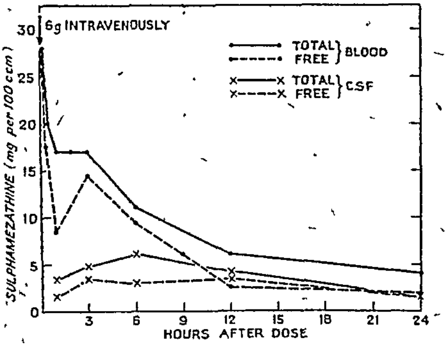

Fig 2—Sulphamezathine levels in blood and CSF after a single dose of 6 g. intravenously.

SUMMARY AND CONCLUSIONS

Patients suffering from cranial injuries were treated with sulphamezathine and its sodium salt, given intravenously and by mouth. No ill effects were observed. Estimations of the drug in the body-fluids of 9 of these patients were performed at intervals during treatment. It was found that rates of absorption, excretion, and acetylation were rapid, and that only a relatively small proportion of the drug reached the cerebrospinal fluid. With the doses employed it was impossible to maintain concentrations in the CSF of 10–15 mg. of the free drug per 100 c.cm., which, by analogy with sulphadiazine, are necessary for effective therapy.

We have to thank Brigadier H. W. B. Cairns and Mr J. R. P. O'Brien for valuable help and criticism throughout this work, and Lieut.-Colonel L. S. C. Roche for permission to use the hospital records.

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Lord WOOLTON will be installed as chancellor of the University of Manchester on Wednesday, May 16. Those on whom the honorary degree of doctor will be conferred after the installation include Sir Wilson Jameson, chief medical officer of the Ministry of Health.

Sir JOSEPH BARCROFT, FRS, will deliver the Harben lectures at the Royal Institute of Public Health and Hygiene, 28, Portland Place, London, W1, on Monday, Tuesday, and Wednesday, Dec. 10, 11, and 12, 1945, at 3 PM. He is to speak on the respiratory function of the blood.

A MEETING of the subscribers of the Naval Medical Compassionate Fund will be held at 3 PM on April 27 at the Medical Department of the Navy, 64, St. James's Street, London, SW1, to elect six directors.

LOCAL ACTION OF PENICILLIN AND SULPHAMEZATHINE AND A PENICILLIN-SULPHAMEZATHINE MIXTURE ON RABBIT BRAIN

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WORKING FOR THE MEDICAL RESEARCH COUNCIL AT THE NUFFIELD DEPARTMENT OF SURGERY, OXFORD

IN a few earlier experiments, briefly mentioned by Abraham et al. (1941), M. A. Falconer and one of us (D. S. R.) applied one of the early preparations of the sodium salt of penicillin (containing approximately 30 units per mg.) in a 0·1% solution in isotonic saline to the rabbit's brain. An injection of 0·1 c.cm. of the solution was also made into the exposed cortex. The three animals so treated showed no postoperative disturbance and were killed after 1, 2, and 4 days. Histological preparations of the brain closely resembled those [illegible] reated with normal saline. At [illegible] was also made of the brains of [illegible] 2 days after a similar solution had been injected into the cisterna magna. As already reported (loc. cit [illegible] unfavourable reaction to the [illegible] their brains appeared norma[illegible] reaction and the ventricular ependyma appeared normal and well preserved.

Recent experience with human meningeal infections (Cairns et al. 1944) points to the desirability of using more concentrated solutions of penicillin than those employed in these earlier tests. Moreover in the treatment of [illegible] areas a powder is more convenie[illegible] have therefore made further [illegible] d with a penicillin-sulphamezathine mixture. The technique used has been described in earlier reports (Russell and Falconer 1941).

CONCENTRATED SODIUM PENICILLIN

Since sodium penicillin is deliquescent it cannot be ap[illegible] was used because a [illegible] was not available w[illegible] re a concentrated solution of sodium penicillin (Pfizer) (500 units per mg.) containing 10,000 units in 1 c.cm., provided by Dr. E. S. Duthie, was applied on soaked pledgets of lintine to the surface of the brain after injecting 0·1 c.cm. of the solution into the cortex. After 10 minutes the lintine was removed, the pericranial flap replaced over the gap in the bone, and the scalp sutured. The four rabbits so treated appeared somewhat torpid after recovering from the anæsthetic and two refused to eat. A pair was killed after 2 and 4 days respectively.

Macroscopic examination.—All showed an undue amount of hæmorrhage and bloodstained effusion beneath the scalp and into the tissues about the site of operation, including the leptomeninges over the exposed cortex. The cortex was somewhat swollen and, in one animal, was diffluent, pinkish-grey, and necrotic. The puncture wound was identified in the other three animals and was not accompanied by any further macroscopic changes.

Microscopic examination.—In one animal, as already noted, there was massive necrosis of the exposed part of the brain, extending to the wall of the lateral ventricle. Early reparative changes were present along the borders of the necrotic area. The ventricle contained a few red corpuscles and large mononuclear cells. The *other three animals* showed less severe reactions. In two the puncture wound showed no extra changes, while in the third a patch of necrosis with small hæmorrhages, measuring about 1·5 by 0·5 mm., occupied the site. The meninges contained an excess of red corpuscles and polymorphonuclear leucocytes over the exposed area. In one example the arachnoid membrane had undergone fibrinoid necrosis. In the two animals killed after 4 days the meninges contained, in addition, a good many spindle fibroblasts and large mononuclear cells. The adjacent cortex in all three animals was œdematous, while the pyramidal cells throughout the superficial third had undergone necrosis in one animal, and severe ischæmic degeneration in the other two. Reparative changes, including vascular proliferation and mobilisation of macrophages, were in progress in the example showing necrosis (killed after 4 days); in a second the outer part of the cortex was fragmented by hæmorrhage, while in the third it was extensively infiltrated by clumps of polymorphonuclear leucocytes, many of which were collected about the bodies of degenerating neurones.

It was concluded from these observations that concentrated preparations of sodium penicillin have an irritant effect when directly applied to the brain. It was therefore proposed that experimental trials should be made of a mixture of calcium penicillin with one of the sulphonamides. Sulphamezathine (sulphadimethylpyrimidine) was selected because it is more readily available in this country than is sulphadiazine, and the indications for its clinical use are similar to those both of sulphadiazine and sulphathiazole. It is sparingly soluble in the tissue fluids. Solutions in normal saline have a pH of between 5·0 and 6·0 (Dr. Liston, of Imperial Chemical Industries, private communication), thus having a considerable advantage over the more alkaline sulphonamides.

SULPHAMEZATHINE

A preliminary estimate was made of the effects of this substance on the rabbit's brain in a series of six animals. The arachnoid membrane over the exposed area was lightly scarified in a few places with the point of a needle, and enough of the powder was sprinkled on the surface to form a complete layer. The pericranial flap was then reflected over the area and the wound closed.

All the animals appeared perfectly normal on recovery from the anæsthetic, and remained so until killed. Three were killed after 2 days and three after 4 days.

Macroscopic examination.—A small quantity of the powder persisted beneath the pericranial flap until the 4th day. The brain appeared normal apart from slight focal hæmorrhage incidental to the operation, and the cortex was normal on section.

Microscopic examination.—At 2 days the cortex at the site of application was slightly œdematous, and superficial neurones were shrunken and hyperchromatic. The adjacent meninges contained a slight excess of red corpuscles and polymorphonuclear leucocytes. There was no necrosis. At 4 days œdema had disappeared from the cortex and hyperchromatic, shrunken neurones were fewer. There was no apparent loss of neurones. Thus the cortex appeared almost normal. In the meninges there was some multiplication of fibroblasts, with adhesion to the overlying pericranial flap. Inflammatory cellular infiltration was sparse. No necrosis was present.

From the histological standpoint therefore the application of powdered sulphamezathine is without any permanent damaging effect upon the brain. There was no clinical evidence of any functional disturbance.

PENICILLIN-SULPHAMEZATHINE MIXTURE

In a further series of four rabbits the exposed brain was similarly powdered with a mixture of calcium penicillin and sulphamezathine (2000 units of penicillin to 1 gramme of sulphamezathine) kindly prepared by Dr. Duthie.

After recovery from the anæsthetic all the animals appeared normal. A pair was killed after 2 and 4 days respectively.

Macroscopic examination.—Slight hæmorrhagic effusion was found beneath the scalp in three animals, and more extensive hæmorrhage in the fourth. Yellow granules of the powder persisted about the margins of the cranial opening up to the 4th day. Focal hæmorrhages mottled the leptomeninges in the exposed area and corresponded, on section, to occasional vertical streaks of hæmorrhage descending into the cortex in two of the animals. In the remaining two the cortex appeared normal.

Microscopic examination.—The leptomeninges throughout the exposed area contained slight or moderate effusions of red corpuscles associated with slight polymorphonuclear cell infiltration and, in the specimens obtained at 4 days, mononuclear cells and fibroblasts. In one of the latter examples there was also some fibrinous exudate and the arachnoid membrane was coated, in a few places, with polymorphonuclear leucocytes. The blood-vessels appeared normal. The subjacent cortex was œdematous and the superficial layers of pyramidal cells had undergone severe ischæmic degeneration. In one specimen, at 4 days, there was some fragmentation of the molecular layer by an interrupted zone of subpial hæmorrhage, and some of the more superficial had undergone necrosis.

DISCUSSION

From the histological observations in these tests it appears that concentrated penicillin alone cannot be recommended as a local application to the brain. Although it might be argued that the single instance in which massive necrosis of the cortex occurred was fortuitous, the animals in this group as a whole showed an amount of hæmorrhage and cortical degeneration that compares unfavourably both with our earlier controls (Russell and Falconer 1941) and with the group in which sulphamezathine alone was used. The latter is remarkably bland in its effects and is indistinguishable in this respect from sulphanilamide and sulphapyridine (Russell and Falconer 1940). These three sulphonamides may be considered as optimal in the various tests upon antibacterial substances that have been conducted in this department during the present war.

The histological effects of penicillin-sulphamezathine mixtures are, as might be anticipated, of an intermediate character: they are less injurious than penicillin alone but are more irritant than pure sulphamezathine. Nevertheless, where clinical conditions demand such a mixture, it might well be considered that the relatively trivial irritant effects of the mixture are outweighed by the advantages of its use. In any event it will obviously be necessary to re-assess the histological effects of penicillin when this is obtainable in a pure form; the irritant action observed in the above experiments may be due to the impurities that are known to form a considerable proportion of even the best samples at present available.

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FIXATION OF SKIN-GRAFTS WITH HUMAN PLASMA AND THROMBIN

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IT is generally agreed that skin-grafting should be done as early as possible in the treatment of extensive burns involving skin loss. Even where the burned area is capable of re-epithelialisation, early debridement and skin-grafting will lead to better results and shorten the period in hospital (Patey and Scarff 1945). One of the main difficulties in carrying this early grafting into practice is the oozing of blood which follows the excision of the slough and interferes with the fixing of the graft in position.

Sano (1943a) has described a method of fixation of skin-grafts, in which this difficulty is largely overcome by the hæmostatic action of plasma, which quickly controls the oozing of blood when applied to the surface to be grafted. In Sano's method the plasma also acts as an adhesive which fixes the skin in position by means of the fibrin gel produced when a suspension of the white cells in Tyrode solution is painted on the graft. This renders unnecessary the use of stitches to fix the graft, except in larger grafts.

In our experience, the main disadvantages of Sano's method are the rather troublesome laboratory procedure needed before operation, and the difficulty and upset to the patient, particularly when dealing with children, in withdrawing the necessary quantity of blood. This method having been tried with success, we decided that, no new principle being involved in the mechanism by which the clotting of fibrinogen is induced, equally good results should be obtained with freshly drawn citrated plasma. In addition, the hæmostatic and adhesive effects could be obtained as satisfactorily by using thrombin solution in place of Sano's cell extract, thus obviating the disadvantages of the original method. Sano (1943b) has also shown that autogenous plasma is not necessary for successful results, but since the experiments were carried out on guineapigs it did not follow that successful results would be obtained with the human subject when plasma from other human sources was used.

On the other hand, relatively pure fractions of human plasma, including fibrinogen and thrombin, have been available to workers in this field in the USA, following the fractionation of human plasma by Cohn and his [illegible] ese fractions have been used in [illegible] s apparently with success. So [illegible] thrombin from this source are not generally available in this country, and we therefore prepared thrombin by a method described by Herbert (1940), later also producing fibrinogen by a similar method. The fibrinogen, however, proved to be very [illegible] ultimately be proved that the stable isolated clotting fractions will displace other fixatives. Freshly drawn [illegible] hich should [illegible] not freshly [illegible] power to inhibit the growth of a great many micro-organisms. In our work, this property seemed to offer advantages, which we considered sufficiently important to offset the advantages which might be gained by the use of fractions not possessing this property.

We have now carried out over sixty grafting operations using, as fixing agents, plasma and thrombin supplied by the Glasgow and West of Scotland Blood Transfusion Service, and have been encouraged by the success of the results to present this report on the results of this method.

PREPARATION OF THE PLASMA

The plasma used is obtained from blood from a group AB donor. It is separated from blood after the necessary serological and grouping tests have been carried out, and not later than 48 hours after withdrawal from the donor. The plasma is withdrawn aseptically into a sterile container of suitable dimensions (50 c.cm.) without any treatment. No tests for sterility are done, for the storage conditions would prevent the development of any accidental contaminant, and in any case the results could not be obtained in time to be of value. In some of our earlier work we added 1 in 1000 of 5- [illegible]

number of completely successful grafts, even in wounds in which the presence of staphylococci had been reported.

Plasma belonging to group AB was chosen because it was thought that the absence of the α and β agglutinins might be an advantage. So many other blood factors are involved that there is probably little point in this, but so far [illegible] o the other ABO grou [illegible] processed plasma as [illegible] ransfusion services throughout the country should not be used, for this has been treated to remove the clotting elements.

PREPARATION OF THROMBIN

The [illegible] prepare [illegible] require [illegible] these c [illegible] method (*loc. cit.*), [illegible] through fresh plasma to red [illegible] point at which prothrombin and fibrinogen are precipitated together. The addition of calcium chloride to the mixture of prothrombin and fibrinogen obtained after centrifuging produces a fibrin clot from which the thrombin can be recovered in calcium solution by decanting the solution from the clot. The presence of the calcium ion is not a disadvantage, and it therefore need not be removed.

The thrombin solution may be sterilised by passing through a Jena "5 on 3" type sintered glass filter, the filtrate being collected aseptically in small glass tubes, which are closed with sterile rubber stoppers, and, if desired, sealed with sterile hard paraffin. The sintered glass type of filter causes no loss through adsorption of the thrombin, but the Doulton candle filter should not be used for with this type it was found that considerable loss occurred. A Seitz type of filter may be used if the first runnings are rejected, but in all cases the activity of the preparation should be checked.

Thrombin prepared in this way is very active, and clotting usually begins about 6 seconds after contact with a little fresh plasma on a glass slide. Clotting can be delayed by dilution with sterile saline, the clotting-time being proportional to the dilution.

PREPARATION OF DONOR AND RECIPIENT AREAS

In the preparation of the donor and the recipient areas the skin is washed with a 1% solution of 'Cetavlon,' which is washed off with saline. The skin is then dried and washed with ether. When the granulations on the area to be grafted are exuberant they should be cut down with a sharp razor, and should not be scraped with a spoon. The plasma is then applied with a sterile camel-hair brush. As previously stated, the bleeding, which may be troublesome, is quickly controlled when the plasma is applied. The area to be grafted may also be dusted with sulphanilamide powder, since this does not interfere with the taking of the graft.

CUTTING THE GRAFT

In the cutting of these grafts the dermatome was used throughout. The cement supplied commercially did not prove successful in our hands, and after various trials we finally adopted a solution of pure Para rubber (5% in carbon tetrachloride). This was most effective if applied thinly and allowed to become almost dry before cutting the graft.

Our practice has been to paint the donor area with the rubber solution, and by the time the drum is coated with rubber and ready for use the donor area is almost dry and ready for the cutting of the graft. The raw surface of the graft is painted with the solution of thrombin before application, and it is then applied to the recipient area, which ha [illegible] with the plasma. When [illegible] is advantageous to insert [illegible] graft, and so prevent slippi [illegible] When a thin Thiersch graft is used with plasma and thrombin, the fixation is rapid and secure and no stitches are necessary.

After application of the graft, movement within a [illegible]

During the past year 318 cases of burns were admitted to the wards of the Burns unit, and the outstanding feature has been the elimination, to a very large extent, [illegible] so frequent a source of [illegible] So far, no case showing a [illegible] grafted.

DISCUSSION

There is no doubt in our minds that the method described is an advance in grafting technique, for the following reasons.

Complete and continuous contact of the skin and the underlying tissues is secured. Oozing of blood is controlled and the skin is fixed in position by means of a medium favourable for tissue growth. The method is quicker, since it largely obviates the need for stitching the graft in position. It is not necessary to obtain blood from the patient before grafting, for the materials are readily available from the local transfusion services in a form ready for use.

A possible development in this method, using dried thrombin and plasma dissolved in sterile water as required, is being tried. The ability to store these substances in a form ready for immediate use by simple solution would be a convenience, especially in small hospitals in more remote areas.

SUMMARY

Over sixty burns have been successfully skin-grafted by a method in which human plasma and thrombin are used to fix the skin in position.

Continued at foot of next page

Reviews of Books

Tuberculosis of the Ear, Nose and Throat

including the Larynx, the Trachea, and the Bronchi. MERVIN C. MYERSON, MD, New York City. (Baillière. Pp. 291. 30*s.*)

THIS book is largely based on a personal and detailed study of over 2000 cases of tuberculosis of the upper respiratory tract seen among 18,450 cases of pulmonary tuberculosis. It also has a good bibliography and the views of other writers are given full value in the text. Many of the black-and-white figures of pathological specimens give no real picture of the conditions, and perhaps deserve colour in a second edition. The pathology is well described; Dr. Myerson believes with others that localisation in the larynx is an allergic phenomenon following reactivation of a focus in the lung, a defence mechanism against bacilli invading the larynx from the blood-stream or possibly directly from infected sputum. He divides his laryngeal cases into two groups—active and inactive. Generally speaking, active disease is managed by inactive treatment, and inactive disease by active treatment. Vocal rest is the most important measure, and next in effectiveness are the galvanocautery, artificial light therapy, and injection or section of the superior laryngeal nerve where pain is severe. Interesting chapters cover pregnancy complicated by tuberculous laryngitis, and the uses of bronchoscopy in pulmonary tuberculosis.

Supervoltage X-ray Therapy

RALPH PHILLIPS, MS LOND., FRCS, DMRE, medical officer i/c radiotherapy department, St. Bartholomew's Hospital, London. (H. K. Lewis. Pp. 141. 16*s.*)

Mr. Phillips, with the technical assistance of Mr. G. S. Innes, describes the work carried out in the years 1937–42 in the Mozelle Sassoon supervoltage X-ray therapy department at St. Bartholomew's Hospital. The reasons for selecting the Metrovick constant-potential continuously-evacuated equipment for this important research are set out, and the installation is clearly described and illustrated. The chapter on operating experience and resulting modifications records the difficulties encountered before the X-ray tube could operate at a million volts. Field current in the X-ray tube gave much trouble until intermediate electrodes were provided and hemispherical stress distributors fitted. A study was made by pinhole camera of the focal spot for various electrodes at various voltages. Protection had been studied and Mr. Phillips is able to record that the permitted tolerance dose for the exposed staff was never exceeded. The physical investigations have provided reliable foundations for further research into supervoltage therapy. Mr. Phillips believes that in the supervoltage range the most suitable material for half-value layers determination is unit density material, and for filters lead with lighter materials such as copper and aluminium between the lead and the patient to absorb characteristic radiation. Percentage depth doses were measured in phantoms of unit density wax or 'Presdwood,' and isodose charts were constructed. It is claimed that at 1000 kV there is less scatter of the X-ray beam outside its geometrical limits than at 200 kV—an advantage in therapy. While this is certainly true recent observations suggest that scatter outside the beam is less than certain workers supposed even at lower voltages.

The clinical section of the book is relatively short. Patients selected for treatment by supervoltage were mostly those with cancers in difficult sites—rectum 144, upper air and food passages 109, bronchus 87, brain 56, breast 49, œsophagus 36, bladder 32, and some smaller groups. A comparison is made between the cases treated by ordinary deep therapy before 1939 and those treated by supervoltage therapy. As would be expected the greatest advantage is obtained in the type of case where a deeply-placed tumour receives the higher percentage depth dose of supervoltage from a number of skin portals. The results in cancer of the rectum are particularly striking because of the known failure of deep X-ray therapy in these cases. Cancer of the œsophagus and of the bronchus remain highly intractable, but new methods offer hope of improvement.

This outstanding piece of research was carried out at a time when every difficulty was increased. The building in which the supervoltage installation was housed was several times damaged by bombs.

Physiology of the Nervous System

(2nd ed.) JOHN FARQUHAR FULTON, MA, MD, D PHIL, D SC. (Oxford University Press. Pp 614 38*s.*)

THE old gibe about the inverse ratio between the content and extent of a specialist's knowledge finds a new application today: for now within a specialty there are subspecialties with techniques so specialised that the general practitioner (so to speak) of the specialty can hardly understand them. Thus neurophysiology—a subspecialty of neurology—embraces electro-encephalography and the electrical study of conduction in the nerve-fibre, and both must be interpreted to the neurologist, who has to apply these mysteries to his clinical work. The second edition of Fulton's book is therefore timely. Progress in this field has continued during the war and the new edition covers recent work on the interaction of the various areas of the cortex, cerebellar localisation, conduction and regeneration in the peripheral nerves, and the functions of the cutaneous receptors. Professor Fulton presupposes a good deal of neurological knowledge in the reader. A poet is sometimes described as a poet's poet: this is a neurologist's neurophysiology.

Old Age in the New World

EMILY D. SAMSON. (Pilot Press. Pp. 60. 4*s.* 6*d.*)

AS Miss Samson declares in the opening sentence of her book, there is a curious lack in this country of systematic knowledge about old age. This lack cannot be remedied in 60 generously illustrated pages, but Miss Samson goes a surprisingly long way towards indicating the salient problems old age presents to a kindly and Beveridge-minded community. The book opens with a concise statement of the needs of old people—economic security, [illegible] housing and home-helps, care in sickness, and [illegible] playing a part in the life of the com- [illegible] needs are not peculiar to the old, but for no other large class of the population are they so seldom satisfied. A detailed, partly historical, review of the position in regard to old-age pensions and supplementary pensions; a brief consideration of how Sir William Beveridge proposed in his report to deal with the problem; and a summary account of old-age pension schemes in other countries, cover the topic of economic needs. In a section called Homes of Their Own the inadequacy of existing provision of houses, and the design and planning of dwellings to meet the varied requirements of the elderly, are carefully examined. The section on Occupations begins with a timely reminder that "it is a mistake to think that old people are happy doing nothing"—a mistake into which some of those who conduct infirmaries and homes for the aged manifestly fall. After sections on social amenities and care in sickness and infirmity comes a final statement at once forward-looking and matter-of-fact on the practical needs which must be met if the elderly are to enjoy such happiness as we would wish for them—as much, in fact, as we shall wish for ourselves when we grow old. Throughout this book there is much to make the reader feel that the spirit of the enlightened reformers of the last century is again actively at work in a changed society.

MR. CLARK AND OTHERS (*continued from previous page*)

We wish to acknowledge the supply of plasma and thrombin by the Glasgow and West of Scotland Blood-transfusion Service, and to thank Mr. J. T. Mearns of the Blood-transfusion Service for the routine preparation of plasma and thrombin, Mr. D. H. O. Gemmell, of the School of Pharmacy, Royal Technical College, for the preparation of various rubber solutions, Sister W. Sanderson, of the Burns Unit, for her help in the work recorded here, and the Dunlop Rubber Co. Ltd. for the rubber used.

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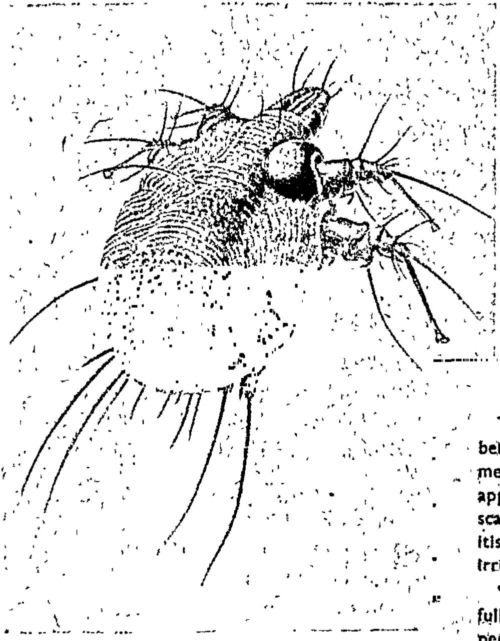

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THE LANCET

LONDON: SATURDAY, APRIL 21, 1945

Cartels, Hormones, and Sharp Practice

A cartel is a combination of producing companies with common interests, who enter into an agreement to regulate competition and allocate markets, often interchanging their technical knowledge and patent rights, but retaining their independence apart from the agreed limitation. Such cartels were severely criticised in the House of Lords last month, when Lord Woolton, agreeing that some were harmful to the public interest, promised a Government Bill to check abuses. Most of us look on these things as the concern of the financial giants, and of no conceivable interest to medical men. Yet a glance at the minutes of a committee set up by the United States Senate under the Sherman Anti-Trust Laws will show that this is far from the truth. A whole volume,[1] for instance, is taken up with their inquiry into the international hormone cartel, and no-one interested in keeping financial power politics away from therapeutics would find it dull reading.

International cartels have been accused of fortifying monopoly, parcelling out the globe into spheres of influence, keeping up prices, and unscrupulously excluding competitors. These accusations are supported by the well-documented evidence based on the investigations of the US Department of Justice. It is the German influence in the cartel system which first strikes the eye. Mr. Wendell Berge, an assistant attorney-general, provides chapter and verse for the general remarks in the House of Lords debate on the Germans' use of their patents system for discouraging manufacture and research in countries not normally inhabited by the *Herrenvolk*. He shows also how during this war German firms have been helped by their trade associates to evade the British blockade; how they have used "paper corporations and dummy consignees" to counteract the black-list in Latin America; how they have, among other devices, elaborated deceptive labels and packages so as to preserve markets for Germany in the post-war years, and have managed to restrict the supply of synthetic products like desoxycortone which can contribute to the treatment of military casualties.

While they would not deny to German chemists legitimate credit and reward for their discoveries, the United States hold the Damoclean sword of the anti-trust laws poised somewhat uncertainly over all commercial combinations which can be deemed monopolistic. Our own law may be more tolerant; our patent laws, the Lord Chancellor has lately said, are better than those of America. Be that as it may Mr. Berge's analysis exhibits dangers which the British legislature must somehow avert. The hormone cartel consisted of five large European companies—the "world leader" in Berlin, one firm at Mannheim, one in Basle, one in Holland, and one in France. The German infiltration process is gradual. The German firm first sells its exports overseas to all who will buy; then, as sales develop, it makes a local firm its sole agent; next it sends out a German expert to take charge; then it constitutes its own company managed from Germany with Germans or German sympathisers in all key positions; finally it builds its own factories in the most important countries while still maintaining a strong central control. In the United States before the war the German interests in the subsidiary companies were disguised under a neutral camouflage. As war approached the subsidiary would take over personnel and facilities from the controlling firm in Berlin, supply the latter's markets, and create new subsidiaries to handle business in the British Empire, Latin America, and so on. So an ingenious organisation arose to keep German goodwill flourishing and German markets open until Germany was once more free to appear uncamouflaged before its customers.

An even more serious revelation which emerged in the Senate's inquiry was the possible use of the cartel system to erect a barrier between the patient and new medical discoveries. To take one example, œstrogenic hormone before the war was produced exclusively on the Continent from concentrations of the urine of pregnant mares. The œstrone was separated and then was hydrogenated to convert it to œstradiol. Hydrogenation was essential because it increased the potency about five times, but the process was registered in all European and American countries. This gave the German members of the hormone cartel complete control over the production and marketing of preparations containing œstradiol, since no-one could compete without the German patent. All went pleasantly along until the synthetic œstrogen, stilbœstrol, was produced in 1934 by Prof. E. C. Dodds and his colleagues of the Courtauld Institute at the

published without any question of patent rights and therefore anyone was free to make the drug. This immediately jeopardised the position of the cartel, and a minute among one of the constituent firms' papers reveals their anxiety. Two firms wanted to have this compound "just to be able to knock it with physicians"—a phrase which the Department of Justice interpreted as meaning that they wanted stilbœstrol as their product so they would be free to tell doctors that it was unsatisfactory, whereas, if it belonged to a competitor their criticisms would naturally be discounted. It would have been a disaster if this topsy-turvy salesmanship had led to the disappearance of a drug of first-class and increasing importance. A few years later, in spite of a favourable report by the Therapeutic Trials Committee of the Medical Research Council, an American article[2] described the toxic manifestations of stilbœstrol in such terms that it appeared suitable for nothing but rat-poison. But fortunately stilbœstrol survived all attempts to "knock it."

Mr. Berge's summing-up was that, in this field of synthetic hormones, the cartel control had been detrimental to United States interests. In Britain, according to the Lord Chancellor, seized German patents will not be allowed to revert to the defeated enemy when the war ends—patents, in fact, will be treated like other enemy property in the United Kingdom. Emergency measures will thus, in the course of winding up the war, end the cartel by eliminating its German-created constituents. Will our laws allow a new hormone cartel to be built when the rubble of the old has been cleared away? Some degree of public direction and scrutiny seems essential if such combines are to assist rather than interrupt the progress of medicine.

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[1] Hearings before a subcommittee of the Committee on Military Affairs, United States Senate. Part X (Dec. 9, 1943): Monopoly and Cartel Practices. The Hormone Cartel. Washington 1944.

[2] Shorr, E., Robinson, F. H., Papanicolaou, G. N. *J. Amer. med. Ass.* 1939, 113, 2312.

Milk Policy

THERE are two voices in milk policy—the producer's and the consumer's. In the long run they ought to blend, but one cannot be sure that the self-interest of the producer, however enlightened, will fit exactly the needs of the consumer. The end in view is clean safe milk of high nutritional value, available to the public in sufficient quantity and at a reasonable enough price to tempt everyone to drink a pint a day. The present milk-supply in England is unsatisfactory in both quantity and quality. Opening the stimulating debate in the House of Lords on April 11, Lord BLEDISLOE put the position bluntly: "... In the matter of the general milk-supply, its quality, the individual milk consumption, the milk yield per cow, bovine disease, veterinary treatment, and the number and qualifications of our veterinarians, Great Britain compares unfavourably with most of the other civilised countries of the world, including indeed some uncivilised countries such as Germany." During the debate it was generally admitted that the prevalence of four bovine diseases—mastitis, contagious abortion, sterility, and Johne's disease—by reducing the annual production of milk by about 200 million gallons was responsible for an enormous annual loss to dairy farmers and to the public health. In addition, large numbers of cattle have to be slaughtered from time to time on account of foot-and-mouth disease.

During the war the Ministry of Agriculture has taken active steps to augment the milk-supply. Milk was given the highest priority of any food produced in this country, and the cow had first call on available animal feeding stuffs. Producers were assured of a market for all their milk up to the summer of 1948 at guaranteed minimum prices. The milk-recording scheme, suspended early in the war, was revived in 1944, and special attention has been paid, through artificial insemination and the licensing of bulls, to better breeding of the calves. The result of these measures is that the quantity of milk delivered off the farms after six years of war is 12% greater than in 1939. With the object of improving quality the Ministry hopes to increase the number of TT herds by paying a special bonus of 4*d*. a gallon to producers of this grade. The National Milk Testing and Advisory Scheme was introduced in 1942 with the object of improving the methods of all who handle milk, in both production and distribution. Under this scheme the milk of 83% of all producers is bacteriologically tested every fortnight throughout the year, the main war-time difficulty being to reach the remote producer-retailers. The difficulty, here as everywhere, has been shortage of staff.

The loss of milk from cattle disease is a graver problem; but the keys to its solution are clinical examination and research. A voluntary scheme for the control of the four major diseases was introduced in 1942. Under this the veterinary surgeon undertakes, as part of a contract with the farmer, to examine the herd at least four times a year. The Ministry provides free laboratory diagnosis where necessary, free abortion vaccine, and sulphonamides at a low price for the treatment of mastitis. A second scheme—for the vaccination of calves against contagious abortion—was introduced at the end of 1944. The Ministry undertakes to provide for the vaccination of heifer calves at the low charge of 1s per calf. This scheme is not yet in full operation but it is a good indication of the direction of post-war progress. The most serious hindrance to all advances, however, is the lack of trained veterinary surgeons. Lord BLEDISLOE strongly supported th recommendations of the Loveday report tha veterinary study should be given full university statu and that veterinary research should be established in all training centres. His general recommendations deserve wide support: (1) a proper survey of the incidence of cattle disease throughout the country (2) increasing the bonus given for milk from attested herds, and an intimation that, within a fixed period milk from herds which are not free from tuberculosis will not be accepted for human consumption; (3) establishing a free State veterinary service; (4) marking cows eliminated from attested herds so that they cannot be sold into other herds and so spread disease without the purchaser knowing that the animals are affected; (5) compulsory vaccination of calves against contagious abortion; (6) a compulsory health service for cattle; (7) establishing disease-free areas gradually extending to cover the whole country; and (8) a State abattoir service under veterinary supervision

These are admirable proposals, but from the medica standpoint they have two limitations which were noted later in the debate by Lord MORAN and the Earl of LISTOWEL. In the first place, they are long-term recommendations: wise and statesmanlike as they are, they do not meet immediate needs Secondly, like many other suggestions made by non-medical speakers in the debate, they seem to assume that a clean milk produced from attested herds is by that token a safe milk. It is not so. Again, although it was frankly recognised that some 40% of our cattle are infected with tuberculosis, some speakers comforted themselves with the cheerful reflection that only 0·5% or so passed tubercle bacilli into the milk This complacency is unwarranted, for, as report No. 246 from the Medical Research Council in 1942 showed, practically all bulked milk representing the produce of twenty herds or more must be infected with living tubercle bacilli. In his recent book, *The Pasteurisation of Milk*, Prof. G. S. WILSON points out that the available figures suggest that "Accredited milk is just as heavily infected with tubercle bacilli as ungraded milk; and that Tuberculin Tested milk is just as heavily infected with *Br. abortus* as ungraded milk, if not more so." One must reckon in addition with other sources of milk contamination from human beings, such as the direct infection from scarlet fever, septic sore throat, or diphtheria, as well as the dangers from patients or carriers who are excreting typhoid, dysentery, or other disease-producing organisms which may be carried through imperfectly cleaned fingers

No doubt the aims of all who took part in this interesting debate were to support the supply of milk that would satisfy the consumer—a clean safe milk of high nutritional value—but the methods recommended were necessarily evolutionary and slow. The needs of the people are immediate. Suppose, by way of illustration, that a certain city finds that its water-supply is continuously polluted; it is no answer for the local authority to say that it intends to construct a new reservoir—the public rightly demand that in the meantime the water shall be made safe. The milk-supply stands in a similar predicament. On all sides it is admitted that milk is being contaminated to a greater or less degree. It is in fact unsafe and should be made safe without delay. Contaminated water can be made safe by chlorination; contaminated milk can be made safe by pasteurisation.

Gas-Gangrene

It is a common criticism of the clinician that his classifications of disease are arbitrary and artificial, and bear little relation to the underlying pathology. To the pathologist gas-gangrene is a clostridial myositis—a specific infection of muscle by one or more of a group of spore-bearing anaerobes. But these organisms are so commonly found in wounds, and so many wounds involve muscle, that such a definition would be too vague to be useful in diagnosis. Moreover, as Frazer and his colleagues point out at the front of this issue, all degrees of involvement can be found, from a simple contamination of muscle tissue to a fulminating invasion, and the pathology of this transition is far from being understood. To the pathologist, then, there will be a mass of cases bordering on gas-gangrene, and the dividing line will be difficult to draw. To the clinician, on the other hand, such difficulties scarcely exist. Clinically all degrees of wound infection short of the massive involvement of muscle with clostridia produce a similar reaction, varying merely in severity and extent, and in assessing prognosis it is probably of little importance to know whether clostridia are present in such a wound. Once, however, a true anaerobic myositis develops the clinical picture changes entirely, and changes very abruptly. Since most, if not all, cases of gangrene originate from simple wound infection with clostridia, it should be easy to detect the stage of transition; but in practice this is rarely possible. It is like the start of an avalanche—for days one may watch the snow falling and fear that a catastrophe is imminent, but the chance of seeing those first few trickles of snow that immediately set the whole mountainside in motion is minute. To put it briefly, one never sees a patient suffering from "a slight attack of gas-gangrene."

In the present war the study of gas-gangrene has been intensive and fruitful. Much new information has been obtained about the clinical pictures, the bacteriology, and the pathology, and as a result both prophylaxis and treatment have greatly improved; only diagnosis has lagged behind. It is true that various new diagnostic methods have been suggested—such as the test described by McClean and his co-workers,[1] and the radiographic technique of Kemp[2]—but these are more likely to be useful in the elucidation of problems of pathology than as aids to early and accurate recognition. In the last war gas-gangrene was common, whereas in this the quicker evacuation of the wounded, the excellence of the forward surgery, and the extensive use of antiserum and (without doubt) of penicillin, have so reduced its incidence that few surgeons, apart from the small number in advanced surgical units in the field, have seen many cases. The growing tendency of the experts to distinguish more closely between gas-gangrene and other anaerobic infections of wounds has probably muddled rather than assisted surgeons who have had little opportunity of seeing battle casualties. Thus the dangerous and unwarranted belief has arisen that the introduction of more potent antisera and chemotherapeutic agents has not only reduced the incidence of this disease but materially modified its clinical picture, with the result that almost any gassy or even smelly wound in a toxic patient is lightheartedly labelled gas-gangrene and treated accordingly. It cannot be too strongly emphasised that the clinical picture of gas-gangrene still conforms accurately with those vivid descriptions that have come to us from the surgeons of the last war. Indeed, where there is any reasonable doubt about the correctness of the diagnosis the condition is almost certainly *not* gas-gangrene. The criteria of diagnosis—the local pain and swelling, the rapidly increasing toxæmia, the peculiar mental changes—are too well known to need further discussion; but in the final resort the diagnosis must rest on the local reaction and the answer to the crucial question: Is dead muscle present, and is it certain that this muscle has not died from vascular damage or from direct trauma? In practice, of course, it matters little why a piece of tissue has died; if dead or moribund, it must be extirpated. But for a true understanding of gas-gangrene the distinction must be made.

Early in this war it was established both by M. G. Macfarlane[3] and by MacLennan[4] that antitoxin is of considerable value in the treatment of gas-gangrene—a point that had been in doubt since 1918. But the recent introduction of high-titre antisera and powerful chemotherapeutic agents has accentuated still more the fundamental importance of adequate surgery. Skin and subcutaneous tissues showing reactive œdema and discoloration may safely be left behind at operation, but unless all the infected muscle is removed the patient will surely die: even very large doses of circulating antitoxin will not save his life if excision is inadequate.[5] As Frazer and his colleagues in Birmingham suggest, this may well mean that the profuse toxæmias seen in gas-gangrene are due less to the direct action of the bacterial toxins on vital centres than to the liberation of products of tissue breakdown. And not the least important feature of their work is the demonstration of the effect of lecithinase on lipoid tissue throughout the body, both in man and experimentally in animals. But, as they point out, this does not indicate that antitoxin is of little value; only that it must be given early and in large amounts.

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[1] McClean, D., Rogers, H. J., Williams, B. W. *Lancet*, 1943, i, 355.

[2] Kemp, F. H. *Ibid*, March 17, 1945, p 332.

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Annotations

SOLDIER TURNED CIVILIAN

AN experienced professional student of war, Prof. Willard Waller, set out to show America the size and complexity of the problems raised by the ex-soldier.[1] After this war the problems raised by the returning warrior, whether in victory or defeat, will be great in every country, and will call for careful and informed handling. Waller reminds us of the havoc wrought by disgruntled veterans throughout the world's history: they are a weapon ready to the hand of any man or system, whether good or bad, which can use them. His book shows how the soldier is made, and how he becomes isolated and even alienated from the civilian world he leaves behind, so that on returning from war he finds himself at first unable to understand or speak the language of civilians. He has learned the profound satisfactions of comradeship in arms, and is loth to relinquish them. His training has taught him to be cruel, pitiless, and competent in killing, yet strangely merciful and understanding to his enemy at one and the same time. By gaining the all-conquering courage which is virtue no. 1 of the soldier's moral code, he has learned to live among horrors, and in the company of fear and guilt. One day the war ends and the soldier becomes a returning veteran, his military skills of a high order rendered useless and unimportant in a single moment. He comes back to a strange and alien homeland; perhaps he is angry and bitter, a little coarsened and difficult to live with, having strange, almost inexplicable swings of mood and sudden eruptions of temper: for in these ways the psychic strain of war shows itself in ex-soldiers during the difficult years when their swords must be beaten into ploughshares. The process of fitting them into family and industrial life will not be easy. We may say glibly that patience and understanding will be required; but their practice is as difficult to imagine beforehand as is the practice of war by the untried recruit. Professor Waller would like to see a planned national programme, especially for those veterans who may be disabled in body or in mind. He warns against the pauperising effects of pensions, and urges the need for a great national experiment in the resocialisation of the soldier turned civilian. In sharp, simple, everyday language he outlines the size and urgency of the problem, and gives clear and practical advice.

PRIMARY ATYPICAL PNEUMONIA

THERE can be few Service physicians with charge of beds who are still unfamiliar with the clinical and radiological picture of primary atypical pneumonia. Since its main features were described in these columns in September, 1944,[2] the American commission on acute respiratory diseases has strengthened the case for a virus ætiology by successfully transmitting the disease to human volunteers.[3] In this issue Turner describes a further 286 cases among British troops in Italy. These were mostly true to type, but he raises two interesting points: the difficulties of diagnosis in cases with a pleural effusion, and the negative results of cold-agglutinin tests.

Pleural effusion was found in 11 of his cases; in 5 the effusion was large, and aspiration produced a yellowish clear sterile fluid with a few mononuclear cells in 4 of these and a blood-stained sterile fluid in the other. It is clear that if these cases had been seen for the first time when the effusion was present it would have been strongly suspected to be tuberculous. The case-records show that X-ray evidence of pneumonia was obtained before the effusion developed; so the ætiology was not in doubt. But one wonders how many men with pleural effusions and no such previous evidence have been labelled tuberculous and discharged from the Services to clear up rapidly without any obvious residual lung lesion. The differentiation is evidently not simple, and Turner usefully reminds us of the possible alternatives.

Some of the recent knowledge about the diagnostic value of cold-agglutinations was summarised in our annotation of March 12 (p. 310). The American commission[4] found that in atypical pneumonia the test was most decisively positive about the 18th day of the disease, but even then in only 31% of their cases was the titre sufficiently high to distinguish atypical pneumonia from other respiratory diseases. Humphrey[5] also found the most certainly diagnostic titres between the 16th and 23rd days of the illness. At this time, however, the patient has usually recovered clinically and X-ray films show resolution to be well advanced. McNeil[6] has observed that not all outbreaks of atypical pneumonia produce cold-agglutinins. He used a correct technique and confirmed in all cases, as Stats and Wassermann and Stratton[7] have recommended, that the agglutinins when present were reversible at over 30° C; in the autumn of 1943 his results were similar to those of the commission, but in a second outbreak in the winter he could find no significant cold-agglutinins at all. The experience of Turner, who has also reported positive cold-agglutinins in previous cases, is thus confirmed. This variation in the findings still further limits the value of cold-agglutinins as a diagnostic test. The signs, symptoms, and X-ray findings in primary atypical pneumonia have now been so minutely described that it should be possible for a diagnosis to be made with certainty on these grounds alone; of the laboratory tests, the relatively normal leucocyte count, contrasting with the polymorphonuclear leucocytosis of lobar pneumonia, is the most useful.

DEATH FROM CARBACHOL

A YEAR ago an RAF man died in an Oxford hospital from an overdose of 'Moryl' (carbachol *BP* or carbaminoylcholine), a drug sometimes injected intramuscularly or subcutaneously to overcome postoperative intestinal or bladder atony, or to improve peripheral circulation, but also used in eye-drops to lower intraocular pressure and applied by electrophoresis in rheumatic diseases. The official dose for injection is 0·25 to 0·5 mg., and ampoules containing 0·25 mg. of the drug in 1 c.cm. of solvent are issued for this purpose. For external application moryl was issued as the pure substance, a white crystalline powder, and being hygroscopic this was also put up in ampoules. At Oxford the doctor ordered the patient one ampoule of moryl, meaning the solution with which he was familiar, but the sister who administered it injected an ampoule of the pure substance dissolved in water, which contained about 400 times the therapeutic dose, and the patient died. It appeared that the same instructions were enclosed with the ampoules of powder as with those of solution, the dose being stated to be ½–1 ampoule and no warning being given that the powder was not intended for internal use. In the subsequent action for damages judgment was given against the manufacturers of the drug; the doctor, sister, and hospital authorities were exonerated. The manufacturers took immediate steps to recall all packages of powdered moryl which they could trace, and subsequently reissued it in airtight containers which no longer resembled the ampoules for injection and were accompanied by directions that it was for external use only. By ill fortune there has now been a second death, this time at the Coventry and Warwickshire Hospital. According to a report of the inquest the doctor again ordered an injection of one ampoule of moryl, and again an ampoule of the powdered drug was given with a fatal result. We understand that the ampoule used was one of a batch supplied for electrolysis in 1942—that is, before the packing and instructions were changed.

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[1] Veteran Comes Back. Willard Waller. Dryden Press, Inc., New York. $2 75.

[2] *Lancet*, 1944, ii, 377.

[3] *J. Amer. med. Ass.* 1945, **127**, 146.

[4] *Amer. J. med. Sci.* 1944, **208**, 742.

[5] Humphrey, A. A. *Nav. med. Bull., Wash.* 1945, **43**, 1117.

[6] McNeil, C. *Amer. J. med. Sci.* 1945, **209**, 48.

[7] Stratton, F. *Lancet*, 1943, i, 613.

[8] See *Lancet*, 1944, ii, 609, 669.

Powdered moryl clearly has no business to be in a ward drug cupboard, and hospital authorities should send any that they find there to the dispensary, its proper place; the same applies to all potent drugs in powder form in quantities exceeding a single dose. Moreover, any packages containing moryl powder in *ampoules* should be returned to the manufacturers for exchange. Another lesson must, however, be drawn from these two cases—that solid drugs in solution should be prescribed by weight or in units, except where there is an official preparation of standard strength

FACTORS IN TUMOUR FORMATION

NOT long ago when the Biochemical Society and the Pathological Society met to discuss œstrogens and cancer, Prof. W. E. Gye, FRS, spoke of the need to harmonise the apparent conflicting claims of carcinogens and viruses in the causation of cancer. This view is reflected in the range of the work of the Imperial Cancer Research Fund [1] of which he is director.

In experimental cancer research the present meeting-place of all competitors is the mammary gland of the mouse. In this animal the experimental material has been so standardised that in certain inbred strains all the mice are, so far as man can tell, genetically uniform. In some strains almost every breeding female develops mammary cancer: the reason for this is that the milk of the mothers contains a tumour-inciting factor (the milk factor or tumour agent), which is indistinguishable by present standards from virus Various inbred high-cancer strains exist, each with its own milk factor. Are these interchangeable? L. Dmochowski provides experiments which show that even when derived from tumour tissue and injected into a foreign strain the milk factor is able in the strange mice to cause tumours. This is the case also when the foreign strain is a hybrid obtained by mating any low-cancer-strain female with a high-cancer-strain male and thereby endowing the hybrid progeny with hereditary susceptibility.

Susceptibility is an essential condition for the appearance of the tumour-producing activity of the milk factor. The seat and nature of this susceptibility are, however, quite unknown. One condition for it might be identity of antigenic structure between milk factor and host, as in the case of cell transplantation; but the success of transfer and passage through various strains and hybrids makes this condition improbable. Susceptibility must be sought elsewhere. It was been suggested that milk factor is effective only when supplied to young mice before the mammary glands are fully developed. It is true that young mice are more susceptible in the sense that a smaller dose of injected milk factor is effective in them; but Dmochowski has found that older mice develop tumours though they require more of the agent. The tumour-producing activity of the milk factor thus depends on dosage, on chromosomal inheritance of susceptibility of unknown quality, and on the development by œstrogen of the cellular basis of the tumour. All these conditions are products of Nature, but before we have found out how they combine together another competitor has come in: methylcholanthrene, acting at a distance from the mammary gland, is able to cause mammary cancer even in the absence of milk factor [2]—a finding which has just been confirmed.[3] Both hereditary susceptibility and œstrogen are still required.

The more we know, the more complicated the cause of cancer in its widest sense becomes. The appearance of a spontaneous tumour is so highly conditioned that the wonder is that any succeed in growing. Even synthetic agents as powerful as benzpyrene and methylcholanthrene can be thwarted, according to observations made by H. G. Crabtree. By using bromobenzene to lower sulphur metabolism in cells, tumour appearance is delayed and even prevented. The kind of encouragement by non-specific factors sometimes needed for tumour formation is such that it has led Rous and his collaborators in the United States to the idea that cells may become cancerous without going on to multiply and form tumours. The tumour-forming potentiality is sometimes revealed only by applying an additional stimulus. Further evidence in favour of this view is provided by B. D. Pullinger. The encouraging quality of the non-specific stimulus appears to be its chronicity, thus offering a basis for the classical observation that cancer is often preceded by chronic irritation. Nevertheless according to this later idea the cell must already be cancerous.

The very many factors that go to make spontaneous tumours are probably simple in themselves. This we may conclude from all that is known of mouse mammary cancer and also from the success of E. Vasquez-Lopez in obtaining a neoplastic pituitary tumour in the rat. The exactions lie in providing the right conditions in the right amount and order. Adenomatous hyperplasias of the pituitary have long been known to arise in response to œstrogens provided in excess of normal. By causing a second indirectly produced stimulus to act on the pituitary in addition to excess of œstrogen one of the adenomatous hyperplasias became highly invasive. The cause of sarcomatous transformation of the stroma of some mammary cancers is more elusive. R. J. Ludford and H. Barlow find that fibroblastic stimulation by lung tumours in tissue culture occurs independently of milk factor.

THE UBIQUITOUS TREPONEMATOSES

THE ubiquitous syphilis of the civilised world, caused by *Treponema pallidum*, is only too well known to the European doctor, but he is less familiar with tropical yaws due to *Tr. pertenue*, South American pinta due to *Tr. carateum*, the Arabian disease called bejel, and the numerous syphiloids found in various parts of the world, differing widely in their clinical manifestations, but all caused by spirochætes which appear to be morphologically identical. Were these originally one single infection, which has gradually become modified by the habits of life and the environment of their host and by the climatic conditions in which they now flourish? The war, by taking fresh minds to fresh places, may help to fill some of the gaps in our knowledge of these treponematoses, and there are plenty of outstanding questions to answer. Why, for example, is syphilis spread venereally, while yaws and bejel are spread either by contact or by various insects feeding on the infected discharging sores? One explanation is that clothing has forced the parasite to adapt itself to the venereal spread in order to maintain its existence. Infection with one treponema probably affords some immunity against the others, and this is a point in favour of a common origin of these diseases. But the very extensive differences in the methods of infection, the clinical courses, the responses to treatment, and the end-results indicate remarkable modifications in the host, or more probably in the strains of organism. That such modifications can and do occur is evidenced by the effect of transferring a humid-valley-inhabiting native population suffering from yaws to upland localities of lower temperature and humidity. With the change in environment the yaws soon alters its manifestations. When the body is no longer continually sweating the florid lesions become less pronounced and flamboyant. There seems no reason why in many generations condi-

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1. [illegible] Annual Report. Obtain- [illegible] College of

tions of life and climate should not ultimately produce even the substantial differences met with in the local treponematoses which keep coming to light among backward and remotely situated peoples. Their investigation may tell us a good deal about the mutual adaptation between man and his parasites under varying conditions. And our peripatetic correspondent who describes his first meeting with bejel on another page wonders whether all this group of diseases will respond, as syphilis has and yaws seems likely to do, to penicillin ?

SHORTENING LEGS

IN 1933 Phemister[1] described a method of compensating for unequal leg length by fusing the epiphysio-diaphyseal junction at selected points in the sound longer leg while growth continued. The usual cause was infantile paralysis which had stunted one limb ; and the fusion operation was done at the main growing points of the other leg—the epiphyses around the knee. Shortening has become fairly popular since then, and for other lesions such as fracture or disease. The two main methods have been epiphysiodesis, and deliberate resection of the requisite amount of bone from the sound femur or tibia after the end of the growth period. Both methods are probably preferable to lengthening the shorter side, because they are performed on healthy bone, and non-union, as far as shaft operations are concerned, is therefore much less likely. However, the epiphyseal procedure sometimes caused varus or valgus deformity from failure of fusion on one side of the junction, and the calculations of when to do the operation for a particular discrepancy were intricate ; by contrast, the shaft-shortening was exact, but it meant waiting until the patient was 18–20 years old.

White and Stubbins[2] have described a simple technique of recording length discrepancy, and calculating age for operation and for the fusion itself, based on experience in 250 cases. They prefer radiographic records to clinical measurement. Teleradiograms are unnecessary. The patient lies on a table with the feet pressed hard and flat on a platform, and the difference in the distance of the femoral heads from a horizontal line on a plain anteroposterior pelvic film gives the discrepancy in length. There is of course a standard error. If it be assumed—what is not strictly true—that the shortening occurs in the acute stage of the illness and both limbs grow thereafter at the same rate, the problem is to retard the growth of the sound limb so that both become about equal when growth ceases at 16. The time available for this is known ; fusion of the lower femoral epiphysis retards growth by ⅜ inch a year, and the upper tibial and fibular epiphyses supply a further ¼ inch. In this way a fairly accurate estimate can be made of how much to do and how long before the age of 16 to do it —e.g., with 2 inches shortening at the age of 12, growth-arrest above and below the knee will produce approximate equality at 16.

At operation a square chisel is used to remove a block ½–1 inch deep centred at the epiphyseal plate, on the lateral and medial sides of the large bones, and the lateral side of the fibula. The blocks are removed, the adjacent parts of the junction being curetted, and are then reinserted after rotation through 90°. They now act as a double bone-graft across the junction, the two halves of each graft separated by the piece of epiphyseal cartilage removed with them. The operation is essentially similar to Milgram's rotation arthrodesis of the knee,[3] where a large cylindrical block is removed from the bone ends at the level of the joint line and reinserted after right-angle rotation, acting again as a double graft across the joint.

The operation is ingenious, and it must be fascinating to watch these long legs getting relatively shorter through the years. They should not be allowed to get too short, but under-correction is the usual error.

FRANKLIN D. ROOSEVELT

THE successes and failures of Mr. Roosevelt as President of the United States cannot be assessed by contemporaries, especially from a distance of several thousand miles. No historian, however, can alter the fact that he carried the hopes of millions in this country as well as his own. His death at 63 comes therefore as a blow ; but it leaves us profoundly thankful that he died no sooner, and that he overcame his physical disabilities sufficiently to lead his nation. In 1921, when he was 39, he contracted poliomyelitis, and despite great benefit from treatment at Warm Springs in Georgia he never regained the full use of his legs. His attitude towards this handicap will long be an inspiration to disabled people in all walks of life, and his illness has also led directly to increase in knowledge of the disease by which he was attacked. He founded the National Foundation for Infantile Paralysis and for the last twelve years he had celebrated his birthday by launching an appeal for its funds. The proceeds of the first birthday drive in 1934 were given to the foundation at Warm Springs. Other institutions benefited each year and later money was also set aside for research, emergency aid in epidemics, and the aftercare of victims. As an American of his day and generation he appreciated the value of scientific work. Last year, in a letter to the director of the Office of Scientific Research and Development, he wrote : " New frontiers of the mind are before us. If they are pioneered with the same vision, boldness, and drive with which we have waged this war, we can create a fuller and more fruitful employment and a fuller and more fruitful life." These were always his aims.

THE two new MPs who won their seats at the Scottish by-elections last week are both medical men. Sir JOHN ORR, FRS, who will represent the Scottish Universities as an Independent, is a doctor of medicine and science of the University of Glasgow, and won the DSO and MC in the last war. Director of the Rowett Research Institute and the Imperial Bureau of Animal Nutrition, and temporarily professor of agriculture at Aberdeen, Orr has made the study of human dietetics his life-work and was a British delegate to the Hot Springs conference. His thesis that the poorer half of our population was inadequately fed and that poverty and disease were linked by malnutrition was politically more novel in pre-war days when he produced his *Food, Health and Income* ; but his knowledge will still be invaluable at Westminster. Dr. ROBERT MCINTYRE, who becomes MP for Moth[illegible] t Edinburgh in 1938. He is the first [illegible] elected to Parliament.

Surgeon Captain MACDONALD CRITCHLEY, RNVR, will deliver the Croonian lectures at the Royal College of Physicians of London on Tuesday and Thursday, May 8 and 10, at 4.30 PM. He is to speak on *problems of naval warfare under climatic extremes.*

RUSSIAN MEDICAL MISSION.—A medical mission, consisting of two orthopædic surgeons and three engineers, has arrived in this country to study limb prosthesis and particularly the production of artificial limbs. The orthopædic surgeons are Prof. M. N. Polonski and Prof. G. F. Kalmykov, who are connected with the veterans and social security administrations in Moscow and Leningrad. They have been to Canada and America, and are anxious to exchange ideas and experiences. They are making a tour of various British hospitals and taking particular interest in our methods for reabling wounded men.

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1. Phemister, D. *J. Bone Jt Surg.* 1933, 15, 1.
2. White, J. W., Stubbins, S. G. *J. Amer. med. Ass.* 1944, 126, 1146.
3. [illegible] J. E. *Surg. Gynec. Obstet.* 1931, 53, 335.

Special Articles

POSTGRADUATE TRAINING AFTER RELEASE FROM SERVICES

THE Ministry of Health and the Department of Health for Scotland have sent to the universities the following memorandum on postgraduate training for medical officers after demobilisation.

Need for further training or refresher courses.—The Government recognise that many medical officers who joined the Armed Forces during the war were unable to complete the postgraduate training usually received before entry into civilian practice, and that others have had their normal professional experience interrupted or curtailed in certain important respects over a period of years. It is clearly most important that every possible opportunity should be given to medical officers when they are released from the Forces to continue their [illegible] refresher facilities.

Classes of officers concerned—The following are the classes of officers concerned—

I.—Those who joined the Forces within a year or so of obtaining a medical qualification, including those who joined the Forces after obtaining a diploma and would normally have proceeded to take a university medical degree, but were prevented by their recruitment from doing so.

II.—Those who had become established in general practice before they joined the Forces

III.—Those who were training for a specialist career when they joined the Forces or are accepted as suitable for such training on release.

The scheme in outline.—Class I will be offered resident salaried posts for up to six [illegible] teaching hospitals or other hospitals approve[illegible] they will have access to s[illegible] work under the guidance [illegible] visiting staffs. Alternative arrangements may be adopted by certain universities in Scotland. For class II refresher courses will be arranged at hospitals approved by the universities. For class III there will be posts of the "registrar" type in teaching and other hospitals approved by the universities where they can continue their specialist training.

Procedure.—A medical officer in any of the above classes should, on his release, apply personally or in writing to his university or medical school, or to the university nearest to where he is living, or to a central office to be set up by the University of London, which will act not only for all the London medical schools but also as a clearing-house for England and Wales. There will also be an associated Scottish clearing-house set up c/o the Dean of the Faculty of Medicine, The University, Edinburgh. At each university a committee for postgraduate medical education is being formed, with a dean or director, to assist officers on release from the Forces, and their addresses and that of the central offices in London and Edinburgh will be published in the medical press or can be obtained from the Ministry of Health, Whitehall, London, SW1, or Department of Health for Scotland, St. Andrews House, Edinburgh.

The class I applicant will then be considered for a suitable hospital post, and, if there is no post vacant at a suitable hospital within the normal establishment, the creation of a post additional to the establishment will be considered. Those who qualified on a diploma and now wish to proceed to a university medical degree will be placed as far as possible at teaching hospitals.

For class II a refresher course will be arranged by the university at a suitable hospital where sufficient clinical material and suitable staff are available for the purposes of instruction and demonstration. These courses may be either concentrated into a period of two weeks, or spread over a period of about three months on (say) 2 afternoons a week. They would be available at any time within a year of the practitioner's release.

The requirements of class III will be met partly within existing vacancies, and partly by the creation of new posts which will be set up in accordance with the recommendations of the Goodenough Committee.

Finance.—The posts available to class I will mainly be junior B1 posts at the rate of £350 per annum, plus board and lodging or £100 in lieu. In the case of those with [illegible] istance under the Further [illegible] heme may also be available. [illegible] salaried hospital post—e g., [illegible] ilification such as the DPH— [illegible] for such assistance. The refresher courses for class II would be free of cost, and travelling and subsistence expenses, together with the expense of payin[illegible] would be repayable u[illegible] posts available for cla[illegible] posts at the rate of £550 a year plus board and lodging or £100 in lieu.

Further details will be available on inquiry in due course.

COLLEGE OF SPEECH THERAPISTS

THE college held its first conference in London from April 4 to 7. Sir FARQUHAR BUZZARD, FRCP, who presided over the inaugural session, remarked that over many years he had become [illegible] value of speech therapists [illegible] that the comprehensive n[illegible] proposed will not be able to function completely owing to shortage of doctors, and that for a long time to come [illegible] making greater use of medical [illegible] ch therapists. The history of [illegible] ient times was traced by Miss JOAN VAN THAL, and more recent progress by Miss EILEEN MACLEOD, chairman of council of the college. Speech therapists, Miss MacLeod noted, have now got their organisation; the profession has gained its status in relation to the medical profession, and the standard of training given by the college has been accepted as the only portal of entry.

Mr. ZACHARY COPE, FRCS, president of the Board of Registration of Medical Auxiliaries, remarked that none of the universities have a professor or lecturer in speech therapy. Local education authorities, he felt, should regard speech as being at least as important as grammar. Nine out of ten doctors, if asked where they should send a patient with defective speech, would be unable, he said, to give an answer; as an examiner in surgery he has known many candidates who might have failed owing to a speech defect had it not been for a particular effort at understanding on the part of the examiner. He thinks there should be a speech therapist at all major hospitals, and mentioned that outside London there are only 25 hospitals with a speech therapist attached to them. At present the new college has only 200–300 members, but he believes twice or three times as many as that are needed in the country. Many counties, including Cornwall, Dorset, Cumberland, Westmorland, and Shropshire, have no speech therapists at all.

Prof. SAMSON WRIGHT, FRCP, said that knowledge of the physiology of speech and voice has not advanced far enough to be of great use in practice. But speech is only a special, though important, example of a complex series of voluntary movements, and he believes that speech therapists will serve the needs of their patients best if they do not worry too much about theory and mechanism, but concentrate on helping people to speak well. Mr. V. E. NEGUS, FRCS, who presided at this session, agreed with him that it is unwise to attempt to simplify the problem.

Miss KINGDON WARD, principal of the London Hospitals School of Speech Therapy, spoke on the treatment of aphasia and dysarthria. In treating dysarthria, she said, emphasis must be placed on direct speech therapy; in treating aphasia, it must be placed equally firmly on the psychological aspect. But this does not rule out attention to the psychological aspect of dysarthria, nor direct [illegible] ap[illegible] in[illegible]

Speaking on difficulties of speech in school-children, Dr. MARY SHERIDAN said that the association between the child's ability to acquire speech and his mental capacity had so long been recognised that to a large extent we judged his intelligence by his accuracy of articulation and fluency of language. The child whose linguistic development is delayed for any reason is at a severe disadvantage, and by examples drawn from her own studies she showed that this delay is not always due to mental backwardness.

RESTORATION OF HEALTH SERVICES IN LIBERATED RUSSIA

HEARING only brief reports from liberated Soviet territory, it has been hard for us to imagine the chaos and pestilence left in the wake of the Germans. Nevertheless these reports reveal an extraordinary concerted effort by the Russian people to restore services of which they were justly proud.

The Nazis seem to have deliberately wrecked public utilities of all kinds. Clinics and hospitals were burned or plundered of all furniture and fittings, and ambulances were destroyed. Water-supplies were polluted by dumping of sewage into town reservoirs, of corpses into wells; water sources were mined. In all regions infectious diseases had increased during the occupation. With lack of soap and baths, almost complete absence of medical aid, with destitution and starvation, it is not surprising that typhus became epidemic, and in fact it became a grave threat to the Red Army as it advanced. In one liberated camp, of 35,000 women, children, and old men, 2000 were found to have typhus.

CONTROL OF INFECTIONS

To deal with these conditions there was not enough medical staff, and they had not enough time. In two reports we find complaints that authorities failed to realise that in the first days of liberation anti-epidemic measures must take precedence over everything else.

The front-line emergency work was done by anti-epidemic squads—special detachments with disinfection equipment. The 1st Byelorussian front, for instance, had 68 such detachments, with 107 doctors and 335 other medical workers. During the advance the district organisation of sanitary work was replaced by an echelon system.

"The 1st echelon is the sanitary section of the battalion. On the basis of information received from this section, the epidemiologist and his staff who form the 2nd echelon try to localise and liquidate the sources of infection. A 3rd section have mobile laboratories, showers and disinfection units capable of a rapid turnover of work. Finally the sanitary detachment of the army and the base laboratory (which form the 4th echelon) send to the sites of infection military sanitary units which collaborate with civilians in the restoration of health organisations, and together they organise admissions to hospital. The organisation of work depends on the speed of advance. When the army is driving forward at high speed, the 1st and 2nd echelons have not time to carry out extensive inspection and the larger part of the work falls on the 3rd and 4th echelons."

Units seek out cases of venereal as well as other diseases, and immediately provide for treatment, which is later continued by the civilian service.

A series of recommendations made in one report to civilian authorities runs as follows:

(1) All medical men in the district should be mobilised. Transfer from neighbouring districts if necessary.
(2) Prompt attention to repair of baths, wash-houses, food centres. Call for volunteers.
(3) Visit all houses and flats after expulsion of the enemy, to find persons in need of immediate help. Discover sick, and chief sources of infection, and pregnant women and newborn babes. Total search is essential however difficult. Initiative must come from the doctors.
(4) After these preliminary tasks, establish reception centres, clinics, hospitals.
(5) Prophylactic injection of all people returning from hiding.
(6) Restore laboratories (contamination of water- and food-supplies).
(7) Keep population fully informed of danger of infection, by radio, press, talks, and total visitation of houses and flats.
(8) Evacuation of all open and grave cases of tuberculosis to tuberculosis institutions.
(9) Members of the medical profession must have a part in the replanning of ruined cities.

May we pray that here too doctors will have a voice in the replanning!

Without wholesale mobilisation of all resources, rapid restoration of services in the liberated areas would have been impossible. We read that 12,500 medical workers have been sent to these areas, and that 1000 newly qualified doctors were sent to the Ukraine and Byelorussia alone. Medical research institutes and post-graduate schools, especially in Moscow, sent groups of specialists. A group of doctors from the Central Malarial Institute took over the organisation of the anti-malaria work, a group of Moscow pædiatricians are at work there, and another group organised by the Obukh Central Institute went to the Don Basin to help in anti-epidemic and hygienic measures.

A report from the Ukraine gives a picture of the stages of restoration of medical services. The first hospitals in liberated Ukraine "were organised by gathering beds, equipment, and clothing from among the people. In a very short time, however, we were able to adopt measures for real restoration work. The whole of the Soviet Union rendered us assistance." By August 1, 1944, the number of hospital beds had reached 48% of the pre-war figure.

Restoration of tuberculosis services is well under way: 164 tuberculosis dispensaries have been opened in the Ukraine, and steps have been taken to accommodate in hospitals and sanatoria more than 10,000 patients.

One report states: "At Debazhevo medical workers themselves repaired and adjusted the apartments of a hospital, clinic, and two medical stations." Elsewhere a member of a medical mission to Russia has told how one morning he came upon theatre sisters helping builders in the hospital grounds, and in the afternoon saw the same sisters assisting at operations in the theatre.

A message from Moscow correspondent of the *Times* (March 19) tells of the alarming conditions found in Poland. Dysentery, typhoid, diphtheria, and especially typhus, are widespread. "The epidemics originated in the ghettos, where the Germans crowded the sick and healthy together in appalling conditions . . . Warsaw, a chaos of ruins above a labyrinth of underground passages choked with unburied dead and rotting food products, is an ideal breeding place for vermin, and vermin may easily carry disease to the ring of overcrowded villages around Warsaw and to Praga, with its 300,000 inhabitants living on unfiltered water from shallow wells in a town without a sewage system." In view of the destruction of Polish medical services, the Soviet authorities are tackling the problems of localising infectious diseases and providing medical supplies. The former Polish director of the State Institute of Tropical Diseases in Gdynia has been given wide powers to organise anti-epidemic work.

AN EARLY FUTURE

In the two decades before this war the public health services of the Soviet Union had developed remarkably; indeed they led the way in some of their schemes of health education, and reablement, and child-welfare services. They were the object of intense civic and national pride. While their destruction must have been heartrending to those who had helped to build them, there can be no doubt of their rapid restoration and the attainment of a higher level than before in the plans of the Soviet Union, not for a remote post-war world, but for a very near and practical morrow.

BRITISH EMPIRE LEPROSY RELIEF ASSOCIATION.—Colonel Oliver Stanley, Secretary of State for the Colonies, will be the chief speaker at a meeting to be held at the Mansion House, London, on Thursday, April 26, at 3 P.M., to mark the 21st anniversary of the foundation of the Association. The Lord Mayor will preside, and the meeting will inaugurate a campaign to raise a sum of £210,000—or £10,000 for every year of the Association's existence—in an intensified effort to eliminate leprosy from the Empire, which contains some two million sufferers.

In England Now

A Running Commentary by Peripatetic Correspondents

In the villages round Bagdad they will say of a child—"No, he's not had it yet," as in England we might speak of the measles. As you arrive and they know you want to see bejel the children crowd up with mothers and fathers and soon you are surrounded by an eager throng. The early [illegible] diffuse scattered r[illegible] constitutional upse[illegible] been seen. About the same time there are profuse mucous patches on tongue, lips, tonsils, and sometimes severe mucocutaneous sores around the mouth. Spirochætes, indistinguishable from *T. pallidum* of syphilis, teem in these sores. Later lesions of the skin are large [illegible] hich leave [illegible] and leave [illegible] the mouth cause gross destruction with perforation of the palate, and the uvula or the nasal septum and nasal bones may be completely eaten away. Bony changes are common and cause thickening of the tibiæ, or ends of bones, but neural and aortic lesions do not seem to occur.

After seeing yaws in its abundance in Sierra Leone in the early part of the war, and syphilis in its profusion in rather more civilised parts of the world, the localised disease bejel is a fascinating problem. Limited in distribution, arising in infancy (I saw babies under a year old with florid mucous patches), with a spirochæte apparently identical with that of syphilis, the relation to syphilis and yaws is intensely interesting. It is possible that like the medieval syphilis with its extensive skin and mucous lesions this is an "'early" form of the same disease. Like yaws it is contracted in infancy and like yaws responds well to arsenic or bismuth. Unlike yaws I saw no plantar keratoses and fissures on the feet, and few of the impetiginous eruptions frequent in that disease.

What a scope for penicillin and what a field for further work! It would be nice to be the first in the field to treat bejel with penicillin.

* * *

When Able Seaman Abel was disabled
  The Admiral was able to invoke
The Reablement Department, so he cabled
  For an Abler—an able sort of bloke.

"I will not have a Rehabilitator
  On any ship of mine," he said. "In fact
I ducked one once, when crossing the Equator,
  And have no reason to regret the act.

"Had Abel suffered dishabilitation
[illegible]
[illegible]
[illegible] un.

"But Abel is an Englishman, and stabler
  Than to countenance so orotund a term.
When disabled, he's reabled by an Abler—
  As, when able, AB Abel will confirm."

* * *

These appalling antenatal clinics—what a menace they must be—no sense of responsibility—never know what happens to their patients—and the doctors who run them have not s[illegible] students, for [illegible] How extra- [illegible] it [illegible] w a large pro- [illegible] their antenatal work to be done at the clinics [illegible] by the boroughs—see report of the London [illegible] Services (Voluntary Organisations) Joint [illegible]e. Surely this is risking their good name. [illegible] mortality-rate in LCC maternity units for booked patients, excluding abortions, seems quite creditable to all concerned: 0·87 per 1000 in 1938 for all obstetric causes (as quoted in the report on *A National Maternity Service* by the Royal College of Obstetricians and Gynæcologists). Can it be that the municipal clinics are not as bad as they are painted? From the critics' strictures one would expect that they are contributing more than their share of the stillbirth and maternal deaths, and that the hospitals get their serious obstetric emergencies from them; but is there any evidence that this is the case?

The two reports I have mentioned are planning for the future, and to plan wisely it seems essential to be sure of the present facts.

* * *

> "The most spectacular feature is the 'Rotolactor,' invented by H. W. Jeffers, which is a giant rotary milking unit 60 feet in diameter, holding fifty cows and moving at the rate of 15 feet a minute. On this 240 cows are washed dried, disinfected and milked every hour—a complete herd of 1680 cows in 7 hours. The Rotolactor is housed in a lactorium in which temperature and humidity are controlled. All workers are under medical supervision. Not only the milking but the feeding of the cows is scientifically studied and controlled in order to maintain the cows in health and enable them to produce a milk of high vitamin content."—*Food Manufacture,* Dec. 1, 1944.

Far from being a prophetic dream of H. G. Wells this monstrosity is already in operation in the USA and held up as an example for us to admire. But, taking the long view, how about the effect on bovine psychology? There should be a good opening for the enterprising student who studies for a qualification as Bovine Psychiatrist to deal with maladjustments in cows who remember sweet pastures and languorous days.

* * *

"The old idea of Air Reconditioning," said Polycarp in his usual emphatic way, "was complete and utter tripe. You know the sort of thing—nice, clean, warm, sterile air as from top of Mont Blanc." I had dropped into his laboratory at this time not entirely by chance, for I knew he was addicted to the awful habit of "elevenses," and even as he spoke a commendable lab. boy entered, carrying an old crusty bottle of Vinum Futurum—Ah, and that vintage year 1950 too!—and two tactful glasses.

"Now this little gadget here," he continued later, smacking his lips and showing me a little pocket affair, "which I hope will be fitted into every bus, cinema, schoolroom, and doss-house in the country, not only filters the air of its [illegible] and viruses back i[illegible] sort of continuous [illegible] the mucous membrane can deal with them to our advantage?" I asked, feeling I must earn my nip. "Lord, yes. They knew that even in the twenties." He picked up an old book, Bray on Allergy, and showed me two references: pollen absorbed rapidly by non-sensitives, slowly or not at all by sensitives; also pollen lysed by the blood of non-sensitives. "Of course, those old chaps had the wrong angle. They tried to raise a race of Pirquet-negatives and succeeded in making TB flamingly epidemic instead of potteringly endemic. They used to come the heavy with the sulphas; and the poor patient never got any immunity. Nowadays we use the sulphas like a fly-rod—for playing."

Polycarp filled his glass again and went on. "The great thing nowadays is to have a little patch of *Penicillium*—one of the new varieties, *grandiflorum* or *fragrans* for choice—growing on one's own person. Then one can be as naughty and unhygienic as one likes." "But doesn't it rub off with the clothes and things?" I asked. "Not if you put it in an out-of-the-way spot. I've got a patch behind my left ear and another in the arm-pit. That wily old bird, Professor Winkle, the Government Pathologist, who has to handle all sorts of muck, he's planted a whole lot of varieties in his umbilicus." "Like a rock garden," I remarked rather fatuously.

Polycarp ignored my simile, finished his glass, and summed up. "The extraordinary thing is that those old boys in the forties didn't realise that in a predominantly bacterial and virose world—bar the glacial regions—our only possible policy is symbiosis."

SELECTIVE WEED-KILLER.—Imperial Chemical Industries have devised a substance of the plant hormone type which is harmless to cereal crops and grasses but kills weeds such as yellow charlock, wild radish, corn buttercup, and pennycress if applied at a rate of 1 lb. per acre. 'Methoxone,' as the weed-killer is called, is now undergoing trials by the Ministry of Agriculture.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

THE House was deeply shocked by the news of the sudden death of President Roosevelt, and on Friday adjourned after a session of only eight minutes. The proceedings were reduced to a bare statement by the Prime Minister, but a statement showing deep emotion. The passing of the great President and war leader such a short time before the assembly of the World Organisation Conference at San Francisco is a misfortune to the United Nations and indeed to the world. The announcement of the new President, Mr. Truman, the Democratic senator from Missouri, that the Conference will take place as arranged gives confidence. But the shocks of peace may be as great as the shocks of war.

Talk and speculation as to the date of an election in Great Britain continue and the political ground is no longer so steady under the feet of Parliament as it was. And when a decision as to the date is made it will probably be made suddenly.

Questions to the Minister of Health attempting to probe the mystery of the half-unveiled negotiations between him and the medical Negotiating Committee did not bring any clear reply. And probings will continue. The House is not satisfied with the rate of progress in these white-paper negotiations. For unless the main lines of the comprehensive medical service, as far as domiciliary work, consultants and hospitals, are laid down soon, difficulties in starting the service will increase. When any large number of doctors are demobilised and wish to begin, as many will, professional work on their own account in civil life is there to be a comprehensive service in which they can take part? Or are the present arrangements, or lack of arrangements, for private practice and hospital work to continue? An interregnum of this kind would complicate the building of a comprehensive service on which the Government and the medical profession are both largely agreed. An early general election may mean that these complex professional and administrative problems become an issue in election politics. From any standpoint, medical, local authority, or national government, informed opinion in the House hopes that this may be avoided. Delay at present is not only dangerous in itself but will actually create more difficulties for the future.

Debates on housing have taken place in the Lords and the Commons and tempers are rising in these debates. The shortage of houses will evidently be a major feature of all election discussions and in many areas it may well be the major issue. The tactics of war are not yet being applied to the housing battle of peace and the demand for more vigorous action is becoming strident.

The House, like the nation, is awaiting the proclamation which will mean that the war with the German army is over and that the guerrilla fight is on. But the prospect is bleak. In Europe there are many millions of displaced persons—slaves, prisoners, deportees, or volunteers—and the fields of Europe will give but a reduced yield at the next harvest. The strategy of peace must be as bold, as far-seeing, and as courageous as the strategy of war, or there is a danger that peace may be a way of continuing war by other means.

FROM THE PRESS GALLERY

Cows and their Milk

IN the House of Lords on April 11 Viscount BLEDISLOE asked the Government what steps they were taking to augment the country's pure milk output, in the interests of national health and physique; whether they endorsed the view that the prevalence in Great Britain of bovine diseases involved an avoidable, underproduction of milk, estimated by experts at 200 million gallons a year; and if so, whether they contemplated any remedial measures capable of being put into immediate operation. Our individual milk consumption, our general milk supply, its quality, the milk-yield per cow, the incidence of bovine disease, and the number and qualifications of our veterinarians, compared unfavourably, he suggested, with most other civilised countries. The unreliability of our milk was tacitly admitted by enforced pasteurisation in most of our great cities, and its inadequate consumption was admitted by the welcome State provision of milk for [illegible] mothers. But these were palliativ[illegible] must be tackled at its source—animal disease.

Mastitis, contagious abortion, sterility, and Johne's disease were largely responsible for the low milk-yield of our dairy cattle. Tuberculosis, though most talked about, was, he considered, the least objectionable disease from the standpoint of milk supply. Although nearly half the cattle of the country reacted to the tuberculin test, only 0·5% yielded milk containing bovine tuberculous germs. All these diseases were, in the opinion of veterinarians, preventable. Their steady increase in recent years were due in no small measure to lack of veterinary supervision and control, the relative paucity of veterinary practitioners, their non-employment by many stock-owners, and the lack [illegible] and professional status of many who [illegible] practice.

There were approximately 3 million dairy cattle in Great Britain, with an average annual yield of 500 gallons each. The pre-war daily consumption of milk per head was 0·45 of a pint. It was now 0·58, an increase of 30% on a very low yield. He suggested that the lowest target to aim at was 0·75 of a pint, with rather more for children and nursing mothers, and expert opinion favoured one pint. On this basis, the national consumption would be over 2000 million gallons a year, the product of over a million additional cows at the present level of yields.

DISEASE-FREE MILK

To increase our supplies of disease-free milk quickly, Lord Bledisloe suggested that there should be a survey of the incidence of disease throughout the country, an increase in the bonus given for milk from attested herds, and an intimation that within a fixed period, say 5 or 10 years, milk from non-attested herds would not be accepted for human consumption. A free State veterinary service should be established. Cows eliminated from attested herds should be marked, so that they could not be sold into other herds and spread disease. There must be compulsory vaccination of calves against contagious abortion, and a compulsory health service for cattle instead of the present voluntary panel scheme. Disease-free areas should be established and gradually extended until they comprised the whole country. A State abattoir service under veterinary supervision should be set up. If the production and control of milk were brought under the direct supervision of the Animal Health Division of the Ministry of Agriculture Lord Bledisloe held that the early diagnosis of disease would be materially facilitated.

The Duke of NORFOLK, Joint Parliamentary Secretary of the Ministry of Agriculture, said that milk delivered off the farms during the last six months was 12% more than in the corresponding months of 1939–40. There were some 17,000 attested herds with approximately 635,000 cattle and the milk produced by 83% of all producers was tested every fortnight. Among producer-wholesalers the proportion was 92%, and although efforts were being made to get at the other 8% the small dairies caused difficulty. Every effort was being made to contact the producer-retailers, and whereas only 16% were tested in 1943 the figure now was over 37%. The category C producers, who were producing the lowest-quality milk, had been reduced since December, 1913, from 5·5% to 3·7%. He agreed that they might reduce the losses by disease considerably, and the Government had already introduced some new measures including the scheme for the control of the diseases of dairy cattle, the scheme for the vaccination of calves against contagious abortion, and the provision of expert assistance to veterinary surgeons on sterility problems.

He feared that it might well be some time before they could get the numbers of veterinary surgeons that they would require. The essence of the report of the Loveday Committee on Veterinary Education was that certain universities should take a larger part in the training of veterinary surgeons. These recommendations were now under the consideration of the Royal College of Veterinary Surgeons, the universities, and the two Agricultural Departments, and proposals were to be laid before the council of the college this week.

VIRTUES OF MILK

Lord MORAN, president of the Royal College of Physicians, quoting Sir Clifford Allbutt, said that man began life on milk and ought to end life on it. That was sound physiology, and they were all united in wanting people to drink more milk. But how much more? It was really a matter of what was possible. If they took 0·8 of a pint a day as a target they would need a total production of 1650 million gallons a year; whereas if they took a pint it meant 2000 million gallons a year. Taking the lesser target it meant a 75% increase in our winter production and a 30% increase in our summer production. That increase could only come from an addition to the existing herds, or from an increased yield. It was computed that if all existing knowledge was utilised in about 5 years the additional yield from cows would supply 40% of the increase desired. The other 60% would have to come from an addition to our herds. He urged that the National Milk scheme should *become permanent after the war and that every adult should be able to get a pint of milk a day.* "Should be able to" raised the question whether the consumer would be willing to buy milk in competition with other foods at market prices. If not, Lord Moran asked, would the Government be willing to go on with the subsidies now given in the interests of the health of the nation?

Bulls had been selected in the past largely by appearance instead of by the milk-yield of their progeny. He was glad to hear that there was some chance of the reintroduction of the licensing of bulls which had been suspended during the war. The cow had a housing problem like her master, but he hoped housing would not be used as a pretext for saying that nothing could be done in the way of getting more pure milk until the building question was dealt with. More important than the housing question were the conditions under which the farmer and his farm-hands worked. If farm-workers went on working a seven-day week, in 20 years the most vigorous and intelligent elements now in the industry would have left it. Was it possible to provide what in medicine they called a locum for the farmer's holidays? Why not a pool of workers for milking?

BIOLOGICAL AND VOCATIONAL EDUCATION

Education fell into two parts. Lord Moran looked forward to the day when every child in the last three years of school life would do some science, including biology. That would mean that the farmer and the farm-worker would know what they were doing, and why they were doing it. But there was also vocational education. He understood that of the 6000 annual entrants to this industry every year less than a quarter could find places in the agricultural institutions. There were, it was said, fewer than 50 research-workers in England and Wales. That was surely utterly wrong. We must have people who could do first-class research. Milk-recording in the pool had apparently only applied to a small minority, whereas it must be universal. There had never been any incentive to the farmer to increase the nutritive value of his milk. He must eventually decide to sell milk by its nutritive value, and not by its volume. A lot more research had to be done on feeding-stuffs to see how they affected the yield.

Lord Moran applauded Lord Bledisloe's exquisite tact in not mentioning pasteurisation. It had always seemed to him that if milk contained organisms, or was contaminated by them, and
disease, then the public, wh
would demand that those
only person who knew hov
vn that pasteurisation
of milk. Our target
e from disease, or to
bottled on the farm
pasteurisation would
die a natural death. At any rate at present this process must be continued. Pasteurisation had been a long controversy because as a nation we suspected experts. He had never been allowed during his working life to forget that medicine was one of those professions which any intelligent layman could understand and speak on with authority. When there was an epidemic of typhoid fever at Croydon, due to the introduction of typhoid bacilli into the water, it caused public disquiet and there was an inquiry. It was not easy to understand why microbes in water caused such alarm and dismay to the public while microbes in milk were accepted with equanimity.

CATTLE DISEASES

The size of the problem of cattle diseases had been made abundantly clear in the debate. We were putting an unnecessary tax on the kind of milk sold, and if we could get rid of these diseases the life of the cow would be doubled. And the last link in keeping milk safe was in preventing its contamination by the personnel who handled it. What seemed to matter most, Lord Moran concluded, were first the education of the farmer and his
secondly, research;
into the question of
and fourthly, that
eding on the milk.
ne who wanted it at
a price that he could afford, that would go a long way to safeguard the future health of the nation, and incidentally the future of British agriculture.

Lord GEDDES affirmed that mastitis was becoming more and more of a scourge, and it did not look as if research, conducted as it had been mainly from the bacteriological angle, had got very near to the heart of the problem. Many of the artificial stimulants of growth now used made a tremendous demand not only on the humus in the soil but also on the minerals in the soil, and he suggested that a great deal of animal ill health resulted from such disturbance in the mineral extraction from the soil. Comparatively small deficiencies in some of these trace contents produced a food which increased the susceptibility of man or animal to bacterial invasion. The work being done at, for example, the Imperial Bureau of Animal Nutrition, near Aberdeen, supplied plenty of evidence of disturbances to resistance in animals through the inadequacy of mineral content in the soil, and he suggested to Earl De La Warr, who was chairman of
Council, that there was now
these problems from the
bacteriological side.

REPLY TO THE DEBATE

The Earl of LISTOWEL, replying to the debate on behalf of the Ministry of Health, said despite the rise in milk consumption during the war we could not be satisfied until we had reached an average consumption of at least one pint per head of the whole population. The Government were vividly aware that much avoidable illness, deformity, and infection could be traced to unclean milk. But taking into consideration war-time difficulties what had been achieved already under the 1942 scheme of the Ministry of Agriculture was creditable, and they hoped to improve on the present record. The Food and Drugs Act 1944, under which the administrative responsibility for provisions of the existing law relating to minimum conditions of hygienic milk production on farms would pass in due course from local public health authorities into the hands of the Ministry of Agriculture, would make possible the enforcement throughout the country of a high and uniform standard of dairy farming, and it might be expected to reduce still further the serious loss to the milk supply due to impurities. But this Act could not be implemented without a substantial increase in the Ministry's staff. The release of man-power after the end of the European war would not, he feared, bring any immediate alleviation, for many veterinary experts in the Services would still be required in the Far East. Available statistics did not expose the whole extent to which public health had already been undermined. But a committee of the Medical Research Council on tuberculosis in war-time sounded a grave warning in a report published in 1942 which showed how widespread tuberculous infection was among cattle and the sad toll it had already taken in child health. In 1931 the Cattle Disease Committee had estimated that 2000 human deaths in England and Wales were due to this cause. But, of course, the death-rate did not by itself give any real indication of the ravages of non-pulmonary tuberculosis, which was not a killing disease. It was not known how many children had grown into hunchbacks and cripples from this cause, but the number must be considerable. And the ill-effects on the health of the public did not stop at this point. The full extent of the human infections transmitted by those who handled the milk was also not known. But 113 outbreaks of epidemic disease, affecting 14,000 people in this country between 1913 and 1937 had been proved to be milk-borne.

HEAT TREATMENT OF MILK

Lord Listowel was anxious that the debate should bring out the plain fact, lamentable as the admission might be, that our dairy cattle were riddled with disease, and that appalling damage had already been done to the health and efficiency of thousands of people, mainly in the rising generation. Unless these elementary facts were constantly in the public mind, the Government would lack the support they needed for effective action. The most effective prophylactic method at present devised attacked the disease-carrying germ not in the animal but in the product. The Ministry of Health had long taken the view that adequate heat treatment of milk was desirable in a widely extended form. The Cattle Diseases Committee of the Economic Advisory Council recommended in 1934 that large towns should have powers to prohibit the sale in their areas of any but certain innocuous classes of milk. A provision to that effect was included in the Milk Industry Bill of 1938, but that Bill was dropped owing to opposition. The urgent need for more pasteurisation was emphasised again in 1942 by the committee of the Medical Research Council on tuberculosis in war-time. The Government decided to act in accordance with this wide consensus of instructed opinion, and issued Defence Regulation No. 55G which was administered by the Ministry of Food. This regulation laid down that the Minister might specify certain areas in which milk might not be retailed or given away unless it was either tuberculin-tested milk, accredited milk from single herds, or specially treated so as to have lost the dangerous bacilli that it might originally have contained. The actual specification of suitable areas under this regulation could not take place however until certain preliminary inquiries had been completed. As an interim measure the Ministry of Food had decided to pay to milk retailers, wholesalers, and depôt proprietors as from Nov. 1, 1944, an allowance of ¼*d.* a gallon in respect of all milk submitted by them to heat treatment. It was estimated that the average cost of heat-treating milk was ½*d.* per gallon. In the margin allowed in fixing the price of milk in England and Wales provision had been made for the cost of heat-treating milk to the extent of ¼*d.* a gallon. This provision in the margin, over and above the actual cost of distribution, of ¼*d.* a gallon, plus the direct payment of ¼*d.* a gallon now made by the Ministry together made exactly the ½*d.* a gallon that was needed to cover the cost of heat treatment. The Government could fairly claim that the quantity of milk being heat-treated in existing plants was likely to be considerably increased with the introduction of this heat-treating allowance. It was a solid inducement and was already producing results. Meanwhile, the necessary preliminary inquiries for the application of Defence Regulation 55G, on which future ministerial action must depend, were already under way. The factual surveys in the great majority of the 621 areas in England and Wales were being drawn up and of these 216 had already been completed. The Ministry of Health was satisfied, after the most careful inquiry, that heat treatment properly carried out destroyed the germs without materially affecting the nutritive quality of the milk. It was clearly in this direction that any hope of a really effective stamping out of milk-borne disease must lie.

On the following day the Earl of Listowel said that the passage in his speech in which he stated that our dairy cattle were "riddled with disease" went considerably beyond what the facts justified. The Minister culture had naturally lost no time in drawing his attention to the full implications of those words. An unfortunate impression had been created in the public mind about the health of our dairy cattle, and this was, of course, far from his intention. He therefore withdrew the offending passage and substituted the words "an appreciable portion of our dairy cattle are infected with disease."

QUESTION TIME

National Health Service

Dr. E. Summerskill asked the Minister of Health, (1) what purpose had been achieved by issuing the white-paper on the health services, in view of the fact that he had now, in response to representations from the BMA, proposed an alternative structure fundamentally different from that outlined in the white-paper; (2) why the proposed salaried medical service operated from health centres and offering a new advance in medical practice had been dropped at the request of the BMA; and (3) what was the purpose of the experimental health centres contemplated in the alternative proposals to those contained in the white-paper, in view of the fact that they would provide accommodation from which doctors could conduct private practice more conveniently but on the same terms and lines as those practising from their homes.—Mr. H. Willink replied: The proposals in the white paper were for discussion before the Government decided on the terms of draft legislation. Discussion was invited with all the major professional and other organisations affected, and this discussion has been—and is still—taking place. In the course of it various possible modifications of the detailed proposals have been discussed by the Secretary of State for Scotland and myself with the several organisations; that is what the discussions were for. Soon the Secretary of State for Scotland and myself will consider with our colleagues some of these alternative methods of achieving the white-paper's objective, a comprehensive service of health for the nation. The Government will have then to decide whether these—or any of them—are desirable alternatives or not Before informing the Government of their views on these possible alternatives, the various organisations—medical, dental, voluntary hospital, local authority—are considering, on reports from their representatives who took part in the talks, the matters which have been discussed. It is to some of those reports, no doubt, or to varying rumours about those reports, that recent references have been made. When the views of the different organisations are available the Government will decide upon the content of draft legislation for submission to the House, while discussion of much detail which may not need to be included in the Bill itself will go on. Until then the three stages of the procedure originally laid down—the white-paper, discussion of the white-paper, and final preparation of draft legislation—are being adhered to, and the objects of this second stage have been those which were clearly set out in the introductory paragraphs of the white-paper.

Dr. Summerskill: Is it not a fact that before a whit paper is published full discussions have already taken pla between the people interested, and that so far as this questi is concerned the BMA, and other medical organisations, h already threshed out every question of principle with t Ministry? (Cries of "No.") The Minister said that on details are being altered, but is it not a fact that in this repo which has been published and is in the hands of every doct in the country, and many lay people, too, every fundament principle laid down in the white-paper has been altered?

Mr. Willink: The hon. Lady is under a complete m apprehension with regard to the function of a white-pap A white-paper in such a case as this represents the outco of discussions, but it also affords a new focus for discussio particularly after the white-paper has been discussed in th House. The white-paper itself contemplated that the would be such discussions. She is under a further mi apprehension, as I understand the facts, when she refers the publication of this report. My information is that eve copy of this report was marked "Not for Publication." S is under a third misapprehension when she refers to anythi having been dropped. My answer makes it perfectly cle that the Government as a whole have not considered the ou come of these discussions.

Dr. Russell Thomas: Is not the real reason for t Minister's change of mind the realisation that this Parliame has no mandate to enslave a free profession?

Mr. F. W. Pethick-Lawrence: Has the Minister given a indication to the medical authorities that he himself w support these particular proposals with his colleagues in the Government ?—Mr. WILLINK: In the course of discussions of this kind I should certainly not express an attitude to any [illegible]

Dr. SUMMERSKILL said that, in view of the unsatisfactory nature of the Minister's replies, she would raise the matter on the adjournment of the House at the first opportunity.

Later Mr. ARTHUR GREENWOOD, on the question of the future business of the House, said that as it appeared that as a [illegible] arrange for a white-paper to be issued showing what departures, if any, had been made from the white-paper which was discussed and approved by the House, because this document published by the BMA was not available to members of the House ?—Mr. ANTHONY EDEN, Leader of the House, replied that no conclusions whatever had been reached as a result of the purely exploratory conversations. "There is not the slightest desire to be discourteous to the House in this matter, nor do I think any abnormal procedure is being followed. . . . When we have come to a decision, we will consider how most fairly to present our conclusions to the House, so that the House may have a full and fair opportunity to express itself."

Shortage of Nurses

Mr. R. W. SORENSEN asked the Minister of Health the approximate shortage of nurses in civil hospitals, the number now training for the profession; to what extent the deficiency was being reduced; and what further steps would be taken to increase nursing, medical, and domestic staffs.—Mr. WILLINK replied: The total number of additional nursing staff of all grades estimated to be required on Nov. 1, 1944, at civilian hospitals (other than maternity hospitals and mental hospitals) was 12,355. On the same date the number of student nurses in training in these hospitals was 38,343. The overall shortage has not been reduced during the past year, the wastage having slightly exceeded the considerable intake. Every practicable step is being and will be taken by the Minister of Labour and National Service, in consultation with me, to induce suitable women to undertake nursing and to redistribute the available nurses to the best advantage. The highest priority is also given to the filling of vacancies in hospitals for domestic staff. Any general increase of medical staffs is not possible at present owing to the heavy demands on [illegible] available, but where special [illegible] War Committee is prepared [illegible] proved establishment.

Tuberculosis Contacts

Mr. J. PARKER asked the Minister of Health whether he would make it compulsory for all persons living in a household where a death from tuberculosis had taken place to be medically examined.—Mr. WILLINK replied: No. Tuberculosis authorities are well aware of the importance of supervising the home contacts of tuberculous persons, although this work has been hampered by war conditions.

ROYAL SOCIETY OF MEDICINE.—At the section of odonto[illegible]gy, on Monday, April 23, at 4.30 PM, Squadron-Leader A. B. Macgregor will speak on actinomycosis of the mandible, and Mrs. Lilian Lindsay, LDS, on the recuperative power of the dental pulp. On April 24, the section of medicine will meet at 4.30 PM when Dr. Philip Ellman will read a paper on tuberculous pericardial effusion, and Dr. R. S. Bruce Pearson on mesenteric lymphadenopathy and steatorrhœa. At 5 PM, on April 26, at the section of urology, Dr. Robert Cruickshank and Wing-Commander J. C. [illegible] on the use of peni[illegible] disease. At 3 PM, on [illegible] and state medicine, [illegible] speak on diphtheria antigens. On the same day, at 4.30 PM, at the section of disease in children, Mr Ian Aird and Dr. Martin Bodian will open a discussion on penicillin in the treatment of disease in children.

Letters to the Editor

DORSAL DECUBITUS

SIR,—I was much interested in the remarks of one of your peripatetic correspondents who once wrote of the sufferings of hospital-patients stretched flat upon their backs and held down by the bedclothes. I discussed this matter recently with the late Dr. T. H. Belt. We had been speaking of the frequency of antemortem venous thrombosis, and had agreed that it was usually undiagnosed during life and overlooked at the post-mortem examination. Dr. Belt told me that he had dissected the great veins in (I think) over a thousand cases, and had found antemortem thrombosis, commencing in the femoral or external iliac veins, in a large proportion of the cases examined—my memory is that it was between one and two hundred. I was reminded at once o[illegible] patients are so c[illegible] to resist when ad[illegible], the last position which a patient would adopt voluntarily when desperately ill, and it seems that in the presence of some kyphosis it may involve a hyperextension of the hip-joints and a compression of the femoral veins between the tissues stretched over the joint and the bedclothes stretched over the patient. I suggest that the matter is worth further investigation. If, as Dr. Belt believed, thrombosis is the [illegible] leath in a great number of [illegible] ome lives could be saved, [illegible] if feeble patients were placed in bed in a position more closely approximating to that which they would choose for themselves.

London, W1. J. NORMAN GLAISTER.

THE MEDICAL SUPERINTENDENT

SIR,—In your issue of Jan. 20 the chairman of the London County Council advocates that the individual holding the post of superintendent in a hospital should be a qualified doctor. I have read and re-read his reasoning with increasing amazement and have tried [illegible] visualise his idea of the duties of the post and its [illegible] in the hospital organisation. As I understand him [illegible] considers a medical qualification would help a sup[illegible] tendent in dealing with complaints from patient[illegible] their friends, in the allocation of duties to the me[illegible] staff and in carrying out the instructions of the com[illegible] of management in the use of wards or even of [illegible] hospitals in times of rapid change. Whet[illegible] such objects are worth a five-year university co[illegible] matter of opinion. Personally I very much [illegible] it is in

On the other hand, Mr. Somerville Hasting[illegible] that "a good clinician is but rarely a good a[illegible] trator." The superintendent's clinical activities are [illegible] fore to be limited to "the medical care of the [illegible] staff or some other branch of medicine or surg[illegible] which he is interested." This is to "mainta[illegible] keenness and breadth of outlook." He should not[illegible] ever, attempt the status of a "pseudo-specialist [illegible] he risk losing by indifferent work the respect due to [illegible] from those under his administrative charge. [illegible] would indeed be a pity because in addition to administ[illegible] ing his hospital "it might be desirable for the medica[illegible] superintendent of the hospital to act administratively as supervisor also of the consultant services of this unit (100,000 souls) and also of the health centres or other general practitioner services."

This indifferent clinician, then, who finds after a few years of practice that he is not so keen on the profession of his original choice as to be unwilling to leave it for a few hours a day to administer a large hospital, is to turn his attention to other highly te[illegible] matters. He is to acquire an intimate knowledge of the law as it affects hospitals, and a considerable knowledge of domestic engineering, accountancy, catering, and supply. Finally, being a medical man he is to sit as a me[illegible] but not as chairman on the medical staff committ[illegible] If he agrees with the recommendations of this committ[illegible] he may carry them out at once. If, however, he [illegible] not agree the recommendations are to be referred [illegible] the committee of management "and the superin[illegible] will have to advise the committee of management. [illegible] is in complete control, and his responsibility great.” What an impossible position for the medical staff committee! If this has been the usual practice in LCC hospitals, no wonder the chairman has been convinced by his “ some little experience ” that “ whatever his age a medical superintendent ought to change his hospital fairly frequently.”

If I have misread him I should be grateful if Mr. Somerville Hastings will clarify his meaning, for in times like these many will be interested in proposals from so influential a quarter.

If his proposals are as I have stated then I would enter the strongest possible protest. They mean the domination of practising doctors up to consultant status by colleagues who have either failed or at the least lost interest in their calling to a great extent. Our hospitals would be administered by men who have taken up this work as a second choice and are apparently required to have no further training or qualification for it than that “ they should be encouraged to take a diploma in hospital administration.” What general standard of efficiency is to be expected from such men?

Let hospitals be administered by highly trained house-governors who are laymen and have made this most important and specialised profession their life's work. The head of the hospital or group should be the chairman of the lay committee of management. He is responsible to the public he represents that they get the highest possible standard of hospital service. The medical staff committee should be purely advisory to their corresponding committee of management on technical matters and appointments. They should have the right to publish their recommendations and reports and to pass them to medical committees on a higher plane for information, and if need be for support. In such an organisation there is no place for a medically qualified superintendent with a foot in each camp. W. A. LISTER.

DISCIPLINE IN A MEDICAL SERVICE

SIR.—With the future organisation of medical services under discussion it is inevitable that a major place should be taken by the thorny question of “ control ”—a ix from which radiate many subsidiary problems. dicine is such an individualistic profession that any ngement on personal liberty is bound to meet with derable opposition. It is therefore inevitable that nsidering hospital organisation the position of the al superintendent should come under review. ions in municipal hospitals have changed greatly last 20 years. In the old days most of these were grossly understaffed, and the medical ident was often the only senior member of the l consequently had multitudinous duties to Under the regime then existing these hospitals own and developed out of all recognition until ow deal with a large amount of acute work, and e confidence of the profession and of the public. have, of course, played their part in this trans- ion, but among them is the medical superintendent if the internal hospital system had been wrong it is bable that such rapid strides would have been e. As a result of the changed conditions now operat- it is natural that the functions of the medical superin- ndent should change somewhat, and the Medical uperintendents Society is well aware of this fact. Medical superintendents have a strong clinical interest, and desire to facilitate the fullest coordination and co-operation of all the clinical branches. Had a man desired a post of a purely administrative nature, he would probably have elected to enter the channels of a medical officer of health rather than continue to work in hospital. During the last 20 years there have been many opportunities in municipal hospitals of building up an efficient hospital out of very small beginnings, and this is what attracted many to the work in question.

Some writers quote instances of an unsatisfactory state of affairs where the duties of a medical superintendent are envisaged in the old style and where readjustments have not taken place. But isolated bad examples do not make a good case. There may be a few medical superintendents who carry on in the old tradition, just as there may be a few consultants and practitioners who do not conform to the general standard; but it is noticeable that whilst medical superintendents have been criticised as a whole for some individual shortcomings; they have not entered into discussion by quoting cases on the other side which come to their notice. The Medical Superintendents Society is in favour of the establishment of medical staff committees in municipal hospitals. It is obviously better for the medical superintendent to deal with major matters of policy and hospital management after the combi views of such a committee have been ascertained agreement reached. Surely it is in this coopera way that progress lies. Thus a case such as is cit Mr. Layton in his letter of April 7 would properly sidered by the medical staff committee, who sh course, be equally prepared to deal with any affecting any other member of the medical support the medical superintendent in any thought he should take as a result of t The Medical Superintendents Society is of setting up committees of the non-m of hospital staffs, and bringing forward they may have for the improvement of the

With the principle of the medical s accepted as a sound one, it should also that the medical superintendent has to day-to-day matters which arise, has statutor duties to perform, and also has his duty to the hospital committee.

In the case of voluntary hospitals, though somewhat different, it is a matter for their consideration as to whether coordination could be improved by having one of the existing members of their staff carrying out some similar duties adjusted to the different type of hospital.

City Hospital, Derby. R. G. COOKE

IRON OXIDE DUST

SIR.—Dr. Craw's letter of April 7 about iron oxide dust in the lungs raises a number of points to which we should like to reply.

In the first place, we regret that, in our *short* review of siderosis mention was not made of his article; but this was devoted to blood examinations of hæmatite miners and we felt that it was not entirely relevant to our theme. Dr. Craw in his article did not claim priority for the idea that accumulations of iron ox dust in the lungs would throw X-ray shadows withou the additional presence of fibrosis. Even in his letter of April 7 he implies clearly that he does not altogether believe in the idea. Arguments about claims to priority for new ideas are not very profitable, and the truth seems to be that several people at about the same time begin to think along the same lines, as for exampl Krogh and Lewis in their independent work on the capillaries.

The credit for the idea that aggregations of iron oxide dust in the lungs might cast shadows simply becau it is opaque to X-rays must go to E. L. Collis (1923) whom we mentioned in our paper. He said that “ X-ray photography has disclosed the presence of shadow suggestive of fibrosis of the lungs of hæmatite miners, but the opacity of oxide of iron to X-rays rather detract from the significance of these findings.” The difficulty of drawing valid conclusions about lung X-ray shadows in hæmatite miners is that these workers inhale a mixed dust consisting of hæmatite and free silica, and that in a proportion of cases silicosis develops. As far as we are aware, the first suggestion that an X-ray picture resembling that of early silicosis or military tuberculosis might be entirely due to aggregations of opaq iron oxide dust without associated fibrosis and congestion came from Doig and McLaughlin in 1936 in their paper on X-ray appearances of electric-arc welder Craw's article on hæmatite miners was published in 1937, and Enzer and Sander's in 1938. The latter described the histology of the lungs of an electric welder who had in life shown the characteristic X-ray shadows. They commented on Doig and McLaughlin's suggestion as follows: “ That the iron particles themselves might be causing the shadows without associated fibrosis was mentioned, but apparently this was considered a remote possibility ”—presumably because it was put last on the list of possibilities. On the contrary, Doig and McLaughlin considered it to be the most likely explanation of the abnormal X-ray changes of electric arc welders' lungs. In 1935 and 1936 other groups of workers who also inhale iron oxide dust, such as carbon-arc and oxy-acetylene welders, silver finishers, makers of electrolytic iron oxide, and sinterers of iron ore, were examined and it was found that they showed similar abnormal X-ray lung shadows when the exposure to the dust had been long enough. Short references to this work were made in the annual reports of the Chief Inspector of Factories for 1935 and 1936.

The rouge or iron oxide used by silver finishers is, as stated, refined to a high degree of purity (about [illegible]% iron oxide) and does not contain free silica. For [illegible] reason we are surprised to learn of Dr. Craw's [illegible] packer who has been handling rouge containing [illegible] amount of silica." It seems that the [illegible] is applied to materials which may differ in their constitution. We were dealing [illegible] pure iron oxide used in silver polishing. [illegible] estimate the amount of silica in our rouge, [illegible] relied on the makers' analysis; nor did we [illegible] silica in the lung ash, since there was, and [illegible], to suppose that these men are exposed to [illegible]. It will be remembered, however, that we [illegible] paper that "incinerated and acid-treated [illegible]ved only fine traces of doubly refractile [illegible] i.e. of free silica or quartz. This was no [illegible] seen in the lungs of people who have not worked in a dusty trade. A sample of this rouge has been injected intratracheally into rats and kittens and intraperitoneally into rats. In no case did it produce any fibrosis after being present for several months.

As regards the lymph-nodes, we felt it unnecessary to record that there was no fibrosis suggesting a silicotic origin, since we were not dealing with a mixed dust such as hæmatite.

Nowhere in our paper did we state that iron oxide was [illegible]. What we did say was that in the lungs of [illegible] finisher there were no fibrotic changes, either [illegible] reticular, set up by the inhalation of dust [illegible]ed mainly of pure iron oxide; and that a worker who has inhaled radio-opaque dusts may have an X-ray picture of the lungs simulating early silicosis, miliary tuberculosis, or other pathological condition, and yet have no *obvious* physical disability. As you imply in your leader of March 17, there may be long-term effects from the inhalation of iron oxide dust, and we do not deny the possibility.

A. I. G. McLaughlin. H. J. Barrie.
J. L. A. Grout. H. E. Harding.

University of Sheffield.

PRIMARY TUBERCULOUS INFECTION IN A SANATORIUM STAFF

Sir,—The Ministry of Health demands, besides clinical [illegible]tions, tuberculin-testing of [illegible] sanatorium staff. If this insist[illegible] has any meaning at all, it [illegible]ution in employing negative reactors. The whole responsibility rests on the doctor in charge, for the Ministry is careful not to commit itself to giving any instructions what to do with negative reactors.

Faced with this dilemma of either taking a risk—which sometimes may be more serious than it appears from the lucky experiences described by Dr. Peter Edwards and Dr. Clark Penman in your issue of April 7—or of being left without adequate staff, the scheme operating at the Cheshire Joint Sanatorium makes the best of an unsatisfactory situation. However, cases of primary tuberculosis in young adults do not always respond so favourably to early treatment. As tuberculosis is still the disease without prognosis, is it not dangerous to conclude that with early diagnosis, and (if available) with early treatm[illegible] lost its sting? Surely earl[illegible] treatment provides the best [illegible]. But, other factors being equal, constitution, and natural and acquired resistance, or the lack of it, ultimately [illegible] is nowadays ignored [illegible] to the problem of [illegible]? May I venture [illegible] good results obtained [illegible]tinental countries—promises to be of very great help? Public health authorities lay much stress on anti-diphtheria immunisation, and there is much talk of anti-pertussis immunisation, but people seem to be entirely indifferent towards tuberculosis prophylaxis. Even the Joint Tuberculosis Council report on reorganisation of the tuberculosis service does not mention the fundamental question of [illegible] become an outworn [illegible]an cure." [illegible] Council's investiga[illegible] some time ago by [illegible] Calmette and his [illegible] there should be the chance now to establish contact with this pioneer of tuberculosis prophylaxis and to get the original BCG strain for culture and trial into this country. Apart from the protection of staff in tuberculosis institutions a nation-wide prophylaxis against further spread of this scourge should become a "target for tomorrow."

Doncaster, Yorks. E. G. W. Hoffstaedt.

THIS WAR AND THE LAST

Sir,—From time to time comparisons are made between the mortality from, for example, penetrating wounds of the abdomen, in this war and in the last. These comparisons are, I suggest, misleading unless considered in relation to the measures available for resuscitation.

In this war transfusion therapy has been organised on a new scale. It is now a commonplace for a wounded man to receive a pint or more of plasma at the regimental aid-post; to have more plasma, or perhaps whole blood, at the advanced dressing station; and then to have a travelling drip-transfusion set up which will continue while he is in the ambulance on the way to the casualty-clearing station, where he will receive further blood-transfusion. Sometimes a wounded man receives as much as 12 pints (or even more) of blood or plasma before he is fit for operation. If he is exsanguinated, two or three bottles of *blood and plasma are run into* three separate veins simultaneously.

The result of this excellent service is wholly beneficial from the point of view of the patient, which is all that really matters. From the viewpoint of the statistician it renders any comparison with the figures of the last war of little value. Clearly the proportion of patients who are very bad operative risks but who survive long enough to be operated on is far greater in this war than it was in the last. Because of this one would expect [illegible] any particular condition such [illegible] greater [illegible] it is in most instances a [illegible] to the advances that have been made in surgery—and perhaps more especially in anæsthesia—in the last twenty years.

Rex Binning.

INGUINAL HERNIA

Sir,—I wish to thank Mr. Harold Dodd (*Lancet*, April 7, p. 447) for his kindly comments on my article and his useful appendix. As he correctly suggests, the article is intended to cover the treatment of Army personnel, but at the same time it is an attempt to break a vicious circle of prejudice and self-complacency. Let us assume for a moment that there are a few surgeons whose successes are close on 100%; this still leaves a large number to operate on an even larger number of herniæ, so that some method of repair must be devised which does not depend on the super-dexterity of the surgeon, or *alternatively on a whim of Nature*.

I suggested that after nearly fifty years of modern surgery no single method has proved pre-eminent—with the possible exception of simple herniotomy, which has a limited application; and I pointed out that the one factor common to an otherwise highly variegated system of repair was the retention of the original muscular internal ring. I mentioned by way of contrast that complete closure of this ring together with the rest of the canal after removal of the cord and testicle had proved uniformly successful even under the most adverse conditions. From this I deduced that the internal ring was the potential source of weakness in all the well-known repairs and that a hernial sac once formed in the manner I have suggested, would, in time, outflank and turn the most strongly defended posterior wall. But I did not give adequate proof that the new internal muscular ring is less liable to be stretched and forced than the original one. This omission was due to lack of space and will be corrected in due course. The actual type of repair to the posterior wall, apart from the construction of the new ring, is purely the prerogative of the surgeon; but why use a niblick where a putter will suffice?

Major Bernard L. Williams's line of argument should find ample accommodation in the Bassini coffin.

BLA W. J. M. Brandon.

Public Health

Control of Medical Appointments

The Ministry of Health points out that a difficult situation has now developed in the staffing of the public health services of local authorities. "During the past five years there have been heavy calls from the Armed Forces for medical personnel both for the care of our own Services and, in the last few months, for the reconstruction and reorganisation of the liberated territories; organisations such as Unrra have needed doctors; and there have been a number of deaths and retirements of public health medical officers. These losses have not been balanced by inflow of junior officers."

In future, permission to make appointments will be granted only in exceptional circumstances. Proposals to make any appointment additional to the establishment existing at the end of February, 1945, will be held over for review at intervals, "when approval will be considered, within limits, in whichever cases the Minister judges to have the most pressing claims." Approval will not be given to appointments until every effort has been made to arrange for the duties of the proposed or vacant post to be otherwise carried on. Authorities concerned are asked to consider the possibilities of postponing the retirement of officers reaching normal age of retirement, reorganising the duties of the remaining medical staff, making arrangements with a neighbouring authority for sharing the services of a medical officer, or making more use of the part-time services of private practitioners—e.g., in clinics. It has been decided that doctors in the whole-time public health service of local authorities (as covered by para 3 of circular 2818) must obtain the Minister's permission before applying for any other post.

"The Minister is not unmindful of the special claims that can be urged for certain services—e.g., tuberculosis and venereal diseases, and he recognises that the expedients which he is now compelled to advocate involve some sacrifice of the standard of efficiency which is secured in normal times. He feels confident, however, that local authorities will appreciate the exigencies of the present situation and will cooperate to the full in securing the most economical use of medical man power." The restrictive control involved will be relaxed as soon as circumstances permit.

Infectious Disease in England and Wales

WEEK ENDED APRIL 7

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1343; whooping-cough, 1043; diphtheria, 453; paratyphoid, 3; typhoid, 5; measles (excluding rubella), 22,599; pneumonia (primary or influenzal), 693; puerperal pyrexia, 157; cerebrospinal fever, 66; poliomyelitis, 1; polio-encephalitis, 0; encephalitis lethargica, 0; dysentery, 306; ophthalmia neonatorum, 67. No case of cholera, plague, or typhus fever was notified during the week.

In the week ended March 24, 1 case of typhus fever was notified at Liverpool port health district.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on April 4 was 1195. During the previous week the following cases were admitted: scarlet fever, 33; diphtheria, 27; measles, 184; whooping cough, 2.

Deaths.—In 126 great towns there were no deaths from enteric fever, 1 (0) from scarlet fever, 15 (3) from measles, 6 (0) from whooping-cough, 5 (0) from diphtheria, 76 (5) from diarrhœa and enteritis under two years, and 19 (2) from influenza. The figures in parentheses are those for London itself.

Birmingham reported 11 deaths from diarrhœa and enteritis, no other great town more than 4.

The number of stillbirths notified during the week wa 174 (corresponding to a rate of 26 per thousand total births), including 10 in London.

On Active Service

AWARDS

OBE

Colonel S. J. L. Lindeman, MC, MRCS, RAMC
Colonel James Rannie, MD ABERD., RAMC

MBE

Major J. W. Campbell, MB CAMB., RAMC
Captain Marguerite E. M. Day, MB EDIN., RAMC
Lieut.-Colonel J. N. Hart, MRCS, RAMC

MC

Captain A. J. Clarke, MB, RAMC

MENTIONED IN DESPATCHES

THE ARMY

Brigadiers—
G. J. V. Crosby
H. G. Winter, MC

Colonels—
A. C. Jebb
J. H. Baird
J. W. Eames
A. J. Gardham
D. F. Panton
J. R. Dawson
R. V. Franklin

Lieut.-Colonel—
F. P. M. Anderson
S. W. K. Arundell
N. Bickford
S. O. Bramwell
H. R. Hartnell
A. J. Martin
J. H. Moffett
J. J. O'Dwyer
M. E. D. Roberts
E. J. M. Wenyon

Majors—
H. G. N. Cooper
R. H. Wheeler
J. Brown
J. V. Crawford
E. A. Donegan
J. Duguid
K. J. Dunlop
J. C. Gregory
C. L. Hayshunker
A. Hunter
J. W. Montgomery
W. O'Callaghan
J. Smibert
B. E. C. Stanley
R. K. A. Van Someri

Captains—
N. H. Bloom
J. A. Chamberlin
H. D. Cockburn
K. C. S. Edwards
H. E. D. Flack
C. H. Foggitt
F. D. Forbes
A. T. Freeland
N. H. H. Golledge
A. D. Gould
J. Griffith
J. N. Hamill
E. A. Heaslett
T. K. Howatt
J. S. Mather
P. G. Miller
D. MacD. Milne
J. C. S. Paterson
E. Rea
R. S. Saxton
J. P. Scrivener
J. B. Stafford
L. L. Theron
W. J. Watt

Lieutenant—
E. J. Rubra

INDIA

Brigadier—
W. E. R. Dimond, CIE, OBE

Colonels—
E. A. Burki, MBE
F. R. Cawthorn

Lieut.-Colonels—
P. H. Addison
B. C. Roy
D. F. Eastcott
W. A. Hopkins
G. A. Ransome
M. S. Zan
M. L. Smith, MC
A. K. Gupta
E. J. Currant

Majors—
K. L. Aich
P. Dass
D. G. Horan
P. A. Hubbard
A. N. Roy
G. Sambasivan
A. D. Wilson
L. E. Chaves

Captains—
Abdul Ahmed
L. K. Ananthabalanan
A. N. Ansari
T. D. Brown
P. N. Chatterji
W. A. Clark
Y. D. Deshpande
Mrs. B. F. Dickenso
D. B. Doctor
S. C. Dutta
A. E. Frazer Smith
R. Gardiner
Ghaghadar Mandal
Y. D. G. Ahmed
M. L. Gupta
G. D. Shenoi
A. F. Hussain
M. M. A. Jabbar
R. Krishnamurti
T. L. W. McCullagh
A. Merriweather
V. Rangaswami
S. R. Turkhud
J. Shrinivasan
S. D. N. Sinha
Surab Shapurji
R. B. Tulpule
W. Choudri
D. G. N. Narayan
G. S. Sidhu
N. K. Mitra
Noble Adiseshiah
S. G. Shah

Lieutenants—
M. B. Lall, BURMA A
M. Saifullah

Obituary

DENIS JOSEPH COFFEY

MB RUI, D SC, LLD

Dr. Denis Coffey, former president of University College, Dublin, and vice-chancellor of the National University of Ireland, died on April 3 in his 80th year.

Born in Tralee, he went early to the local school, where his remarkable industry and capacity for absorbing polymorphous knowledge marked him for future distinction. In entering the now defunct Royal University of Ireland he received the highest possible marks, and in 1887 he took his MA with first-class honours—the litteræ humaniores being his relaxation after many hours in biological laboratory or dissecting-room. In his career as a medical student he had but one rival, the late Dr. Edmond McWeeney, first of Irish bacteriologists.

During his early years of medicine in the old ramshackle Catholic University Medical School in Crow Street, Coffey's talents and personality won the confidence and affection of George Sigerson, who induced him to specialise in biology and at whose house he met the cream of literary Ireland. In those days there was little interest in biology in Dublin, but it awakened a new enthusiasm in Coffey, whose transition to physiology was speedy. Studying abroad, he was the pupil of His in Leipzig, and Ramon y Cajal in Madrid. In 1898 he succeeded Coppinger in the chair of physiology, but in 1908, to the regret of many of his friends, he gave it up for the presidency of Universi [illegible] chancellorship of the new [illegible] Ireland. From 1921 he re[illegible] University on the General Medical Council, and he was president of [illegible] cil for Ireland from its inc[illegible] Government appointed h[illegible] in 1940 Pope Pius XI conferred upon him the title of Knight Grand Cross of Saint Sylvester. The Royal University had made him a fellow, and he received honorary degrees from Trinity College, Dublin, and Queen's University, Belfast.

T. W. T. D. writes:—

"Coffey was one of the makers of modern Ireland. In the fifty years of his active life he had unequalled opportunities of influencing three generations of young men who came to study physiology in the medical school between 1890 and 1908 or later in the president's room in University College. His outstanding characteristic was a deep, personal interest in men and women. He never forgot a name, and held in his mind the personal histories and relationships of many thousands of former students. He would spend hours advising and encouraging any one of them with a tireless patience which took no account of time or of the pressure of other work. In University College the President was everyone's sure friend; in Cecilia Street in the early days he was the 'student's professor.' His range of exact knowledge was quite exceptional. From study abroad, he came home to found a physiology school which, under one of his students, Prof. J. M. O'Connor, has developed into an active research centre.

"But Coffey did not limit himself to physiology. He was widely read in many branches of human knowledge, parti[illegible] [illegible] and painting. His [illegible], and he [illegible] without reference to works or records. His prodigious memory served him well, but it led him to neglect the devices which most of us need in the day-to-day routine of administration. Since he was always ready to say what had been done before and what should be done in the future, his long presidency involved him in an immense burden of detailed administration. In some ways this was a pity, but it is probable that no other man and no other method could have steered the college successfully through the very difficult period of its early growth. His life-work was University College. He had much to do with its creation, and his opinion weighed heavily in the choice of every member of the staff. The success of the college in the future will be the measure of his fame.

"But to those of us who grew up under his shadow, it is the memory of his strongly marked personality which, more [illegible] else, will remain as his legacy. A Kerryman, he was a strong man who eschewed heavy-handed methods. He always knew what he wanted, and he never wanted the impossible. If he could not attain his end in one way, he patiently tried another, and only in the last resort would he consent to force an issue. He was never intolerant of other views, but he rarely changed his own, which were formed independently of current fashions or old prejudices. Quite unmoved by the rapidly changing trends of public opinion, he was equally unimpressed by modern scientific cosmologies. His calm, ironic commentary on the modern world was a precious influence in our country during the last half century."

For writing Dr. Coffey found little time, and a few papers on biological and physiological subjects are all his published contributions to medicine. As a conversationalist, however, he was of the first order, and he was a good linguist. His philosophy was based on his religion, which was deeply, if unemotionally, Catholic; his generosity was notorious and often imposed upon. Politically, he was an excellent liaison officer between Ireland and England. As a youth, his sympathies were revolutionary; his anger was aroused by the stupidity of the absentee landlord of the '80's. But his attitude towards England changed, and during both world wars he was passionately Francophile and pro-Ally.

Mrs. Coffey, much his junior, survives him with a daughter and two sons.

GUSTAV ASCHAFFENBURG

M D

Dr. Aschaffenburg, whose death at the age of 78 is reported from Baltimore, had been for 30 years professor of psychiatry at the medical school and university of Cologne. One of the many prominent pupils of Kraepelin, he will be mainly remembered for his pioneer work on the psychology and sociology of crime. In his book *Das Verbrechen und seine Bekämpfung* published in 1903, he was the first to apply psychological and psychiatric interpretation to criminal statistics. He founded and edited a journal (*Zeitschrift für Kriminalpsychologie und Strafrechtsreform*) with the object of advancing penal [illegible] condition and of [illegible] rather then retal[illegible] sulted [illegible] crimin[illegible] over, [illegible] branch [illegible] system of psychiatry in 20 volumes. A vigorous worker, humane, progressive, and cultured, he could not stand the oppressive atmosphere of the Third Reich and emigrated in 1938 to the United States, where he was hospitably received and much honoured.

SPECIAL FOOD ALLOWANCES.—The Ministry of Food has made the following changes in its arrangements for granting special allowances to invalids and persons needing special diets:

> In future children holding the green ration book RB2, who qualify for extra milk under classes I and II of the schedule of conditions set out in the Ministry's booklet M.F.D.2 will receive a *total* weekly supply of 14 pints of liquid milk. [illegible]
>
> Patients with diabetic ketosis will, in future, be granted three sugar rations a week on the same lines as diabetics with other [illegible]
>
> [illegible] ing for extra allowances of soap.

EMPIRE RHEUMATISM COUNCIL.—From Dr. Ralph Pemberton, president of the Pan-American League against Rheumatism, Lord Horder has received a letter congratulating the Empire Rheumatism Council on the decision of the British Government to include in their post-war health policy adequate provision for the treatment of rheumatic sufferers. Dr. Pemberton comments "this will influence thought everywhere."

Notes and News

VISION IN INDUSTRY

THE Association of Industrial Medical Officers met at the London School of Hygiene on March 24 to discuss ophthalmological problems and visual standards in industry. Dr. W. Jeaffreson Lloyd maintained that industry has not given sufficient consideration to lighting, and that legislation in this matter has not been bold enough. Even where there is good lighting, it is allowed to become inefficient. He believed that eye protection is largely a matter for the safety officer. Eye accidents, in his experience, seem to occur in batches and not continuously. To what extent, he asked, should the nurse deal with foreign bodies in the eye? Should there be a factory eye service?

Mr. Joseph Minton, FRCS, said there is no unified accepted system of visual standards in industry and no universal practice of examining new entrants. A complete medical examination of all workers would result in the creation of a huge pool of physically unfit requiring some form of direction. He hoped that in future the direction of workers into jobs for which they are physically best fitted will be combined with the training of the physically handicapped. Examining surgeons should be given instructions as to visual standards required in the various branches of industry. People with all grades of vision and even the totally blind can be employed in modern industry. He showed a chart of visual standards and suggested grading the workers into five visual groups; he then explained the type of work suitable for each visual group. Workers engaged in close work require the examination of ocular muscle balance and binocular vision. Myopes with good vision in each eye are fit to do close work (clerical, &c.), and there was no evidence that close work has any effect on the rate of increase of myopia. One-eyed workers can be employed in most jobs, but the safety of the good eye should always be ensured.

Mr. T. C. Summers, FRCS, remarked on the large number of people with astigmatism. In his industrial experience, every type of eye disease has been discovered on routine examination. He emphasised that the best first-aid treatment for glaucoma is to do nothing except refer the patient immediately to an ophthalmic surgeon. He strongly condemned the use *of a spud for removing a foreign body from the eye.* He finds that hypopyon ulcer sometimes occurs after a foreign body. Penicillin has no effect on this condition, which, however, quickly clears up after the intravenous administration of 500 units of vitamin C. There is a danger that an intra-ocular foreign body may be missed unless an X-ray film is taken. High myopes should not be put on heavy jobs, since there is a danger of detachment of the retina. In his opinion lighting and colour schemes in factories are questions for the physiologist and physicist.

Royal College of Surgeons of England

At a meeting of the council of the college on April 12, with Sir Alfred Webb-Johnson, the president, in the chair, Dr. H. Guy Dain and Prof. Harry Stobie were elected fellows under the charter which permits the council to elect annually to the fellowship two members of twenty years' standing. Mr. R. P. Scott Mason was elected a member of the court of examiners for three years. Mr. Eardley Holland was re-elected the representative on the Central Midwives Board and Air Vice-Marshal Geoffrey L. Keynes was nominated for reappointment as an external examiner in surgery for the Faculty of Radiologists.

The Jacksonian prize for 1944 was awarded to Lieut.-Colonel Kenneth Starr for his essay on the causation and treatment of delayed union of fractures of the long bones. The subject for the prize for 1946 will be traumatic aneurysm. Mrs. Lilian Lindsay, LDS, librarian of the British Dental Association, was awarded the John Tomes prize for 1942–44 for her research work in the bibliography of dental science. The first award of the Begley prize was made to P. C. Conlon of the London Hospital.

It was decided to institute two annual courses of lectures on surgery beginning this autumn. Lecturers will be selected by invitation. Fellows and members of the College will be admitted free, but there will be an admission fee of two guineas for others for each course of 12 lectures.

The council confirmed its previous intention to grant a higher diploma in dental surgery which will be subject to obtaining power to revise the charters. It is proposed to title the diploma fellowship in dental surgery.

Diplomas of membership were granted to W. McC. Anderson, D. J. Atherton, and R. S. Jones. Diplomas in child health were granted jointly with the Royal College of Physicians to the following:—

Gwladys V. S. Aldridge, Florence H. Auckland, Annie C. Brown, E. A. Cachia, Marjorie E. Claye, Kathleen M. Corbett, P. D. A. Durham, P. G. Finch, J. H. Gibson, H. McC. Giles, D. B. Jelliffe, [illegible] ine M. Lord, Kathleen M. Miller, Dorothea [illegible] ia K. E. Reaney, D. C. Thursby-Pelham,

Scientific Film Association

At 1, Wimpole Street, London, W1, on Wednesday, April 25, at 5.30 PM, and at 8 PM the following films will be shown: *A Cautionary Tale about Sepsis*, *A B C D of Health*, *The Treatment of Bronchiectasis in Childhood*, and *The New Lot.* Tickets may be had from the hon. secretary of the medical committee, Dr. S. J. Reynolds, 14, Hopton Road, SW16.

Association for Scientific Photography

The association has formed a medical group, which will hold its first meeting on Wednesday, April 25, at 6 PM, at BMA House, Tavistock Square, London, WC1, when Flight-Lieutenant H. Mandiwall, MB, will speak on visual education in medicine. The group may be addressed at Tavistock House North, Tavistock Square, WC1.

British Council Visitor

Sir Howard Florey, FRS, has left for Sweden, where at the invitation of the Swedish Medical Society he is to lecture in Stockholm and other cities on penicillin. He will also visit Finland.

Royal Institution of Great Britain

On April 27, at 5 PM, Prof. P. A. Buxton, FRS, will deliver the Friday evening discourse on the natural history of scrub typhus. Other discourses include Prof. H. D. Kay, FRS, the secretion of milk (May 18), and Lord Moran, courage and fear (June 8).

Appointments

BARCLAY, R. C., MB CAMB.: RSO, Radcliffe Infirmary, Oxford.

CHRISTIE, ELIZABETH N., MB GLASG., DPH: Child Welfare MO for Glasgow.

MCKELVIE, ALASDAIR, MB EDIN.: MO, Nigeria.

ROSS, K. A., MB ABERD.: outpatient surgical registrar, Hospital for *Sick Children, Great Ormond Street, London.*

TODD, I. P., MD: RSO, Hospital for Sick Children, Great Ormond Street, London.

VICKERS, A. A., MB LOND., DMR: asst. radiologist, Glasgow Royal Infirmary.

Births, Marriages, and Deaths

BIRTHS

ADDISON.—On April 5, the wife of Major G. M. Addison, RAMC, of Westgate-on-Sea—a daughter.

COOMBS.—On April 10, the wife of Dr. C. J. F. Coombs, of Perranar-Worthal, Cornwall—a daughter

FAWKES.—On April 1, at Secunderabad, the wife of Captain M. A. Fawkes, IMS—a son.

HALL.—On April 7, at Birmingham, the wife of Lieut.-Colonel G. S. Hall, RAMC—a son.

HAMBLY.—On April 8, at Seer Green, the wife of Mr. Edmund Hambly, FRCS—a son.

JONES.—On April 6, at Liverpool, the wife of Captain W. J. Jones, RAMC—a son.

MACFIE.—On April 7, at Wokingham, Berks, the wife of Dr. W. G. T. Macfie—a daughter.

MARRIAGES

FREER—HAYWARD.—On April 4, Anthony C. G. Freer, surgeon lieutenant RNVR, to third officer Freda Hayward, WRNS.

MACRAE—RUSSON.—On April 12, at Dudley, John Oliver Farquhar Macrae to Jean Fellows Russon.

TOBERT—NOSKWITH.—On April 10, at Nottingham, Gerald Tobert to Alexandra Noskwith, MB.

DEATHS

BIRDWOOD.—On April 11, at Walmer, Kent, Gordon Travers Birdwood, MA, MD CAMB., DPH, lieut.-colonel IMS retd., aged 78.

DENNING.—On April 13, at Epping, Essex, Charles Ernest Denning, LRCPI, aged 86.

MACKIE.—On April 10, George Mackie, MB ABERD., of Wellington, Salop, aged 75.

MUECKE.—On April 13, in London, Francis Frederick Muecke, CBE, FRCS.

MURPHY.—On April 11, in London, Ellen Theodora, widow of Sir Shirley Murphy, FRCS, formerly medical officer of health for the County of London, aged 87.

ROBERTS.—On April 6, at Purley, Edward Augustus Roberts, MD LOND., formerly of Lowndes Street, SW1. aged 82.

SHEPHEARD.—On April 12, at North Walsham, Norfolk, John Shepheard, BA CAMB., MRCS., aged 78.

The fact that goods made of raw
to war conditions are advertised
as an indication that they are

ORDER AND DISORDER IN THE LARGE INTESTINE*

T. L. HARDY, MD, FRCP
HON. PHYSICIAN TO BIRMINGHAM UNITED HOSPITAL

My intention in these lectures is to give some account of the normal and abnormal activities of the large bowel and such disorders as may be held to depend on disturbance of function. I shall devote the first lecture to certain aspects of the normal mechanism and to functional pathology, and the second to colon neurosis and ulcerative colitis considered mainly from the standpoint of ætiology.

NORMAL MECHANISM

The large intestine, or that part of the alimentary tract which lies beyond the ileocolic sphincter, comprises the cæcum and appendix, the colon, rectum, and anal canal. It follows the general design of the alimentary tract but has its own special characteristics of form and function and the departures from them which constitute its disorders. In using the word "normal," one recognises the wide scope of individual variation within the meaning of the term; variation somewhat tardily recognised and imposing caution on those who would attempt to define the abnormal too narrowly. The history of colon disorders has been neither happy for the colon nor creditable to those who have exploited its misfortunes. A voluminous literature testifies to that common human failing of trying to run before acquiring the more fundamental art of walking. In comparison [illegible] unhappily too often profitable, and progress must inevitably be slow. The chief purpose of the large intestine is the formation, transport, and evacuation of the fæces, and this involves the functions of motility, water absorption, and mucus secretion, each of which will be considered in some detail.

The phylogenetic development of the colon has been determined by the nutritional requirements of the species, and morphologically the human colon lies somewhere between that of the carnivora with a short straight type of colon and rudimentary cæcum, and the long sacculated colon with capacious cæcum of vegetable feeders. Specially noteworthy in the human colon as compared with other parts of the alimentary tract are its capacity and distensibility, the length of time it retains its contents, and the special arrangement of its musculature. The [illegible]
muscular coat in [illegible]
important feature [illegible]
certain other man [illegible]
the rest of the co [illegible]
anatomical saccules, which, supplemented by the folds of the mucous membrane, provide an increased surface for absorption.

The mobility of the large intestine is considerable, particularly that of the transverse and pelvic colons, whose mesenteries permit a very wide range of movement. The cæcum, ascending colon, and hepatic flexure also possess mobility to a considerable degree, the splenic flexure, descending colon, and rectum being relatively fixed. I [illegible]
the essentially floa [illegible]
may show great [illegible]
posture, respiratio [illegible]
alterations in tone during the passage of the intestinal contents.

The recent history of the physiology of the intestinal movements in man is in large measure the history of the [illegible] our present knowledge. One must recognise that the motor function of the colon is still very incompletely understood, due in part no doubt to technical difficulties in the study of the movements peculiar to the large intestine and also to a tardy appreciation and acceptance of normal variation. It is chastening to reflect that it has taken nearly forty years for the wave of enthusiasm which produced the kinks, ptoses, hyper- and hypomobilities, fixations, and redundancies, with the many ingenious methods for their repair, to exhaust itself in the ultimate realisation that most of these were but variations of the normal and compatible with good health.

Filling and Emptying of the Colon

The filling of the terminal ileum begins from 35 minutes to 5 hours after the oral ingestion of barium, and its rate of progress through the ileocolic sphincter is proportional to the rate of gastric emptying. According to Oppenheimer (1940) the terminal ileum is emptied by a tonic stripping contraction, a modified mass movement, which starts some 12 cm. from the sphincter and forces its contents into the cæcum under pressure in from 10 to 20 seconds. The movement occurs at intervals of 3 to 15 minutes as long as food remains in the stomach, being under the control of the gastro-ileal reflex of Hurst. The cæcum prepares for the ileal contents by what has been described by Cannon (1911) and Lyman (1913) [illegible] of all
movement and [illegible] ecum,
ascending and [illegible] large
extent passively by methods which are at present obscure. No sudden change of picture is observed and no reliable observations of peristalsis and anti-peristalsis have been record [illegible] ver long periods
being that [illegible] Oppenheimer
(1941) has [illegible] nts as follows:
the cæcum relaxes to meet the ileal stream, its shadow enlarging and descending sometimes as much as 15 cm.; thereafter the tone gradually increases, the cæcum narrows and rises somewhat, and its contents are propelled onwards to the ascending and transverse colon, a phase lasting 4–24 hours. In a similar manner the transverse colon fills, irregularly at first, and as it fills comes to occupy a lower position. Full relaxation and haustration of the transverse colon is attained 4–15 hours after its filling begins.

I have recently studied, with the assistance of Dr. Cecil Teall, colon function in a series of healthy medical students, male and female, with normal bowel habits. Films were taken in the upright position every 2 hours over a 12-hour period and at a varying time after a standard meal of 4 oz. of barium sulphate in 6 oz. of water. The object was to see if, by taking frequent [illegible] filling could be
[illegible] the results,
[illegible] l conclusions,
[illegible] is haphazard,
showing neither rhythm nor reason, and with almost as many variations as there were individuals. The rate of filling, the mode of filling, the haustral formation and rate of passage, showed extreme variations and an entire absence of any recognisable mechanism or uniform pattern. The transverse colon, too, showed at times a [illegible] One can only conclude
[illegible] n the force of contrac-
[illegible] tly on the tone of the
[illegible] perhaps some other

HAUSTRATION

Haustration begins to appear soon after the ileal contents enter the cæcum and is seen at its best in the familiar appearance of the transverse colon when well filled with barium meal or barium enema. Serial [illegible]
taking place. These have no propulsive value and serve to mix the colon contents and aid in water absorption.

Some uncert [illegible]
[illegible] the haustra do not correspond to the anatomical

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* The Croonian lectures for 1944, delivered at the Royal College of Physicians of London. The second lecture will appear next week.

saccules as at one time thought but represent phases in the constant movements of the mucous membrane produced by contraction of the muscularis mucosæ, as originally suggested by Forsell. There are, however, difficulties in accepting this as the correct explanation of events. The radiological appearance of the colon when fully and deeply haustrated gives the impression of a degree of contraction much more powerful than one would expect from the thin sheet of muscularis mucosæ. In Holtznecht's (1909) original account of the mass movement he described the haustral segments as disappearing and later reappearing suddenly along the observed segment of bowel. A similar rapid appearance of haustra is a normal phenomenon during the flow of a barium enema and does not suggest movements of mucous folds. A more usual, and an older explanation, is that the tæniæ shorten and force the circular muscle coat into folds, concertina-like, thus causing the clefts and haustra. But it would be impossible on this assumption to explain the extreme degree of haustration often seen in the transverse colon when its loop is at its lowest point and the tæniæ therefore lengthened rather than shortened.

Hess Thaysen (1916) regarded the formation of the haustra as due to contraction of the circular muscle coat and as quite independent of the tæniæ. Lineback (1925) suggested, as a result of X-ray studies and microdissections, that the tæniæ play an important part in permitting free play to the movements of the transverse colon by alterations in tonus, and also act as fixed cables to which the bundles of circular fibres are intimately attached and against which they contract to form the clefts and haustra. The trefoil appearance of the haustra which may be seen radiologically under favourable conditions of filling is further evidence of the part played by the longitudinal bands in their formation. During abdominal operations carried out under spinal anæsthesia it is possible to observe these functions of the tæniæ coli, an increase in sacculation brought about by shortening, and an attempt at haustration in the empty bowel by the contraction of the circular muscle-fibres against them. Similar appearances have also been seen in the colons of animals observed through an experimental abdominal window (von Bergmann 1932).

The evidence then suggests that, while the contraction of the muscularis mucosæ and the fluid content of the folds may play some part in shaping colon contours, the clefts and haustra are the results of active contraction of the circular muscle coat and serve the function of mixing and kneading the bowel contents. It would save confusion if the words "saccule" and "sacculation" were reserved for the anatomical divisions of the colon brought about by contraction of the longitudinal bands, while "haustra" and "haustration" denoted a physiological function concerned with movement, similar to the segmenting movements of the small intestine. In the descending colon true haustration is rarely seen unless the contents are fluid, as in a barium enema. Hurst (1935a) has pointed out that the divided shadows usually seen here are rows of barium-containing scybala, which do not fill the lumen and so give no picture of its true outline.

MASS MOVEMENT

The slow and disorderly progress of colon filling is interrupted by the dramatic events of the mass movement first described by Holtznecht (1909) and in this country by Barclay (1912). It was fully studied by Hurst (1919), who showed its dependence on the entry of food into the stomach—the gastro-colic reflex. The mass movement is now everywhere regarded as the normal and probably the only type of systole of the colon, despite the fact that comparatively few people have observed it, a well-deserved tribute to the authoritative studies and narrative powers of those who first described it. With the onset of the movement haustration disappears and the transverse colon becomes shortened, stretched, and ribbon-like. The site of the initial constriction, or poimt d'appui, varies. It may occur anywhere in the colon, though most commonly it is just distal to the hepatic flexure, less commonly in the upper part of the ascending colon, and exceptionally at the cæco-colic junction. From this point the contraction [illegible]s the entire contents of the colon into the descending [illegible] pelvic colons within a few seconds, the whole movement being without subjective sensation of any kind whatever.

To summarise: the movements of the colon appear to consist of a slow and irregular diastolic filling, interrupted two or three times a day by a very rapid and powerful systole. The phase of diastole is conspicuous for individual variations, not only in duration but in the position which the cæcum, transverse, and pelvic colons may occupy. This phase is associated also with the formation of the clefts and haustra which subserve the purpose of mixing.

Defæcation

The movements and primary function of the large intestine are completed by the act of defæcation. The original observations of Hurst (1907, 1911, 1919) remain the basis of our knowledge. In most people the rectum is empty until just before defæcation. The urge to defæcate follows distension of the rectum with fæces from a mass movement which may empty the pelvic colon only, or, more commonly perhaps, the colon from the splenic flexure downwards. The act consists of strong contractions of the rectum and colon associated with relaxation of the anal sphincters. It is supported and reinforced by an increase in intra-abdominal pressure brought about by fixation of the diaphragm in the position of full inspiration, and of the pelvic floor by the levator ani, which also draws the anal canal upwards over the fæcal mass. The passage of fæces through the canal acts as a further stimulus augmenting rectal contraction and relaxation of the sphincters.

A reflex nervous mechanism through the agency of the pelvic nerves with a centre in sacral segments of the cord was described by Garry (1934). Denny Brown and Robertson (1935) observed an automatic, though somewhat ineffective, defæcation in cases in which the sacral innervation of the rectum and anal canal was destroyed by disease. If, however, the sacral segments were intact the rectal contraction had a more progressive character and a greater fusion with consequently a more massive and complete response. This automatic defæcation was only fully effective in the case of fluid contents, a result which Hurst (1935) has attributed to the lack of appropriate abdominal contraction owing to a defective appreciation of rectal distension in these nervous lesions.

This is the merest outline of a most important mechanism but it must suffice. The prompt and proper performance of defæcation is essential for the integrity of the alimentary tract and its failure is the commonest cause of constipation, especially at each end of life; in the young due to faulty training and neglect, in the elderly to a diminished sense of desire and to weakness of the musculature leading occasionally to fæcal impaction, especially after a barium meal.

Nervous Control

The extent and manner of the nervous control of the colon are still obscure, though it is generally agreed that the distal colon and rectum are more intimately under the control of the central nervous system than other parts. Garry (1934) has emphasised the caution necessary in interpreting results obtained under experimental conditions in the light of the normal function of the intact animal, and the even greater caution necessary in transferring these results to man. There is no room for dogma here; at most some tentative deductions.

The large bowel possesses a considerable degree of autonomy, probably more in evidence in the proximal colon and perhaps responsible for the haustral segmentations. The tone and mass movements, on the other hand, though carried out through local reflexes, the myenteric reflexes of Cannon, are clearly much influenced by extrinsic factors through the sympathetic and parasympathetic nervous systems. It seems to be no longer correct to speak of an antagonism between these two sets of fibres except in a very limited sense. Garry (1934) even suggested that the use of the terms sympathetic and parasympathetic was unwise in the state of uncertainty as to their true functions, and advocated the morphological terms, thoracicolumbar and sacral.

Sympathetic effects are in general inhibitory in character and diffuse in distribution, though conflicting results have been obtained by various workers on stimulation of the thoracicolumbar outflow, results which may be affected by the initial tone of the gut walls—inhibition if the tone is high, contraction if low. It must be admitted, too, that much brilliant surgery on the thoracicolumbar outflow, designed to remove inhibitory control, has been disappointing, judged on a long-term view of the results on the colon. The exclusion of all thoracico-

is called int by such states
as fear, pai ydration, and
hypoglycæm asks whether
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emergency, f permanency
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The distribution of the vagus to the colon is uncertain and the effects of section obscure. On the other hand, the effects of stimulation of the sacral division of the autonomic system which supply the distant colon and rectum are well-established—namely, contraction of the bowel with relaxation of the anal sphincter, increased vascularity, and the secretion of mucus. As Cannon (1929) pointed out, distension is the common stimulus for bringing the sacral division into activity, and its main concern appears to be the emptying of hollow viscera which undergo periodical filling. Great emotion, such as is accompanied by nervous discharges through the sympathetic division, may also be accompanied by discharges through the sacral fibres. Certain forms of colon irritability—mucous colic and emotional diarrhœa, for example—are of this type, and the involuntary voiding of the bladder and lower bowel in times of severe mental stress is well known. The work of Wolf and Wolff, to be referred to later, exemplifies the profound effect of psychical stimuli in the field of vagus control.

Absorption and Secretion

The conversion of the fluid chyme into normal fæces involves the absorption of about 500 c.cm. of water daily, derived chiefly from the secretions of the small intestine. Chyme, as it passes the ileocolic sphincter, contains approximately 90% water, the fæces 60–80%. The absorption of water can take place anywhere in the large intestine but does so chiefly in the cæcum and

sodium and chloride over that present in the normal fæces. They suggested that one of the colon's main functions was the conservation of total electrolyte and fluid in the body. Though not normally an important mechanism, it may become so when loss of fluid has occurred to the point of dehydration. If under such conditions as, for example, in ulcerative colitis the operation of ileostomy or right-sided colostomy has to be performed, the maintenance of an adequate fluid and mineral intake by other channels becomes imperative.

SECRETION AND FUNCTION OF MUCUS

The colon is richly supplied with goblet cells which secrete mucus, one of the most remarkable of the body fluids with an importance which has not, I think, been fully appreciated; there are even those who would still wilfully and wantonly wash it away. Little was known of its secretion and properties until the work of Florey, culminating in an important paper by Wright and Florey (1938), in which they were able to bring experimental corroboration to the view long held by clinicians that certain colon disorders were associated with over-activity of muscle and abnormal stimulus of nerve-supply. They showed that muscular contraction, increased vascularity, and mucus secretion were the invariable response to stimulation of the nervi erigentes in the cat, whether the stimulus was applied direct, through the agency of cholinergic drugs, or by the reflex stimulation of the cut end of one nerve, the other being intact. Stimulation of the sympathetic nerves caused opposite effects—relaxation of the gut and contraction of blood-vessels—and did not excite any secretion.

Mucus is a protective secretion in a very complete sense. It is poured out readily in response to irritation and protects the mucous membrane from direct injury. It dilutes irritants and interferes with the diffusion of substances from its surface to cell lumen, or may delay it sufficiently for evacuation to take place before injury is effected. In an earlier paper Florey (1933) had also observed a cleansing property of mucus, particles brought into contact with it by movements of the muscularis mucosæ being subsequently rolled into small masses and passed down the bowel. In the case of bacteria the protection, though clearly far from perfect, may play a considerable rôle in preventing access to the mucosa of pathogenic organisms. Florey (1938) also drew attention to the impor

uggested that the secretion protected the mucous membrane from irritation by acids formed as a result of the fermentation of cellulose.

The protective value of mucus has received striking demonstration in the well-known and remarkable work of Wolf and Wolff (1942), who, in a long series of studies on their patient Tom, a man with a gastric fistula from childhood, have made notable contributions to the physiology and pathology of the stomach under a large variety of conditions. Their work, while lacking something of the romance attaching to Beaumont and St. Martin, is certainly not wanting in drama, and may well prove to be an equally important landmark in the history of gastro-enterology. Briefly, they showed that undue and prolonged acceleration of acid secretion in the stomach, however provoked—and one of their most effective methods was to induce prolonged anxiety

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by suction
a chronic ulcer ultimately developed.

These observers (1943) state that the gastric juice is quite capable of attacking and digesting the mucous
membr vented from gaining
access of alkaline mucus,
which artly by combining
with t eat is the degree of
protection that substances, such as absolute alcohol, which produce moderate erythema when applied to the

applied to the skin, cause no more than a moderate hyperæmia on a gastric mucosa with its normal covering of mucus.

It is a reasonable assumption that the colonic mucosa will respond to injury by similar reactions, not necessarily in degree but certainly in kind. As yet we have no direct evidence of the sort offered by Wolf and Wolff (1942) of the reaction of the human colon to prolonged stimuli, especially of a psychic nature. The
vere purgation or irritation from
is well known; likewise the
mucomembranous colic, or of
blood and mucus, or even blood alone, in ulcerative colitis after severe psychic trauma is well authenticated.

The normal activities of the rectum and pelvic colon can be observed with the sigmoidoscope, and on many occasions I have studied the appearances seen under a variety of conditions in patients and in healthy students. Immediately after normal defæcation there is seen a moderate increase in vascularity and in the size of the mucous folds of the upper rectum. The reaction is intensified after a soap or glycerin enema, while in the few patients I have examined after a turpentine enema there has been pronounced congestion, great increase in the size of the folds, and so much spasm that the lumen remained closed and it was impossible to pass the instrument round the pelvirectal bend—a sufficient commentary on this old-fashioned and somewhat harsh procedure. The appearances are similar to those recorded by White and Jones (1938), who produced wrinkling, spasm, increased vascularity, and mucus secretion of the rectum in a number of healthy students after the use of various irritants and cholinergic drugs applied locally or taken by mouth.

Florey's results from the stimulation of the nervi erigentes in cats have been noted. Larson (1933) showed that in dogs normal defæcation was associated with an increase of mucus, and this was very greatly increased in amount and duration after purgation, especially with castor oil. Lium and Porter (1939a), studying the ætiology of ulcerative colitis in dogs, induced severe spasm in colon explants by mechanical injury and by the injection of cholinergic drugs. These resulted in an initial secretion of mucus which gave place to a watery fluid when the goblet cells became exhausted. Hyperæmia, œdema, and hæmorrhages were commonly observed and ulceration in many instances. They also observed (1939b) that in the human disease ulceration is most definite where the musculature is most powerful —that is, in the rectum and along the course of the longitudinal bands—and they suggest that hypermotility and spasm are important factors in the production of ulcerative colitis in man.

It seems, therefore, that the colon may be capable of much self-injury by overaction, by exhaustion, and expulsion of its normal mucus protection, and subsequent injury by fæces. If with these observations in animals we align those of Wolf and Wolff in man, we can discern a pattern of disorder, and even disease, emerging from a normal mechanism which has been subject to protracted and abnormal strain and ultimately deprived of its normal protection.

Functional Pathology

The large intestine, then, takes care of the formation, transport, and elimination of the fæces, and only in the final phase—the call to stool and the voluntary effort during defæcation—is consciousness involved. Fulfilment of function, as defined by Evans (1935) is attained with the passage of a formed stool, preferably soft, without discomfort or undue effort and accompanied by a sense of completion and satisfaction; and to the extent to which there is departure from this standard will it be judged disorderly. It is not, I think, an over-simplification to regard the disorders of the colon as of two main types—simple habitual constipation, symptomless or with some added mental disquiet; and colon neurosis in which a functional disturbance of the colon is associated with bowel arrhythmia, various abdominal discomforts, and evidence of emotional instability inherited or acquired, in varying degree.

CONSTIPATION

Habitual constipation is colon disorder in its simplest form, and for some it is almost a normal condition and does little or no harm. Many are constipated but few suffer, and those few in mind rather than body, though somatic symptoms often follow. Habitual constipation in almost all cases has its origin in dyschezia and is the result of faulty training. Sound alimentary hygiene is a prerequisite for health, and much solicitude is being exercised today in matters of diet and standards of optimum nutrition. Like forethought should be directed towards proper methods for its excretion, and there is scope for a much improved bowel hygiene to take its place in any system of health education. Where there is so much room for diversity of opinion and none for dogma, I can but state my own opinions in these matters.

The passage of barium and other test materials through the alimentary tract shows such individual variation as to make any definition based on a time factor quite unreliable. As Hurst (1919) stated, to have one action of the bowels a day is often regarded as the only normal condition, but it is really nothing more than a question of convenience as it is found to suit the habits and diets of a majority of the people. Parks (1913) investigated the bowel habits of 1100 male Post Office employees between the ages of 14 and 63, and found that 6·3% had their bowels opened less often than once daily, 52·7% daily, and 41% more than once a day. His figures are substantially the same for various age-periods and appear to be unaffected by conditions [illegible] occupation, sedentary or otherwise, by physical exercise, by climate or water-supply. These figures are similar to those I obtained recently in answers to a questionary addressed to 440 members of the nursing profession living under institutional conditions and on a standard war-time diet—9% of them had their bowels opened less than once daily, 59% daily, and 32% more than once daily.

In terms of physiological function there is less room for variation and I have already defined that function as the passage of a formed stool, without discomfort or undue effort, and affording a sense of completion and satisfaction. If this occurs once, twice, or three times a day, or once every two days, or even twice a week, what matter so long as it occurs? Perfection of function is more important than regularity, but I would add as a general reservation the view expressed by Evans (1929a) that if in a patient the bowels act twice in twenty-four hours or once in forty-eight, closer inquiry must be made into the functional activity of the digestive tract, since this variation from the average normal may be physiological and it may not. The time factor has loomed large, the individual variation been too little noted; and much distress of mind and disorder of bowel has been caused by over-insistence on this factor and by the inculcation of an early morning habit for all and sundry.

As to this habit, I confess myself a heretic and regard it as little better than a tribal fetish supported by much ritual observance and a singularly appropriate mythology. Conditioned reflexes have their disadvantages; they are easily de-conditioned. Civilised man, against all natural law, has attempted to establish a uniform habit for all, and, it must be acknowledged, with some success. But in man even a normal reaction may be an artificial one and thus easily disturbed and frequently decompensated. Change of diet, of occupation, of work and climate, a laparotomy, mild endocrine troubles, and emotional stresses are among the innumerable factors sufficient to derange, sometimes permanently, an acquired mode of behaviour.

Bauer (1940) gives it as his opinion that the chief causal factor of habitual constipation is the habit of defæcating at a certain time, mostly in the morning, mostly once a day, and suppressing more or less unconsciously the desire to empty the rectum at other times. The call to defæcation is said to occur in the majority once a day, and it is stated that the rectum should be empty at other times. As a generalisation I believe this to be untrue. My X-ray studies of normal medical students with regular bowel habits indicate quite clearly that the rectum may contain considerable quantities of barium at other times, especially after meals; in some the sensation was appreciated but ignored because it was not their usual time for defæcation; in others there was no sensation whatever, and it would appear that rectal tolerance also can be conditioned.

I believe that education in bowel hygiene should teach that an action of the bowels, once, twice, or even three times a day is not abnormal and is in accordance with the gastrocolic reflex. No anxiety should be occasioned or suggested if the bowels are not open at the appointed time, nor must there be any neglect to open them at other times if the desire occurs. With change of scene, work, or diet, in times of anxiety and fatigue, a change of bowel habits is often natural, and if this be realised and purgation resisted adjustment soon follows. Much better facilities and a larger measure of comfort should be provided for the important function of defæcation, and there is surely a case for some redesigning of our ordinary sanitary furniture more in keeping with anatomical and physiological needs. It is a time for relaxation in more senses than one.

USE OF APERIENTS

The extent to which aperients and purgatives disturb colon function and may contribute something to its disorders demands a survey, however brief. In the history of purgation the wheel has come full circle, for the purgative habits of ancient Egypt were followed by the Hippocratic warning against the taking of purgatives by persons in good health, a view in conformity with our own modern teaching; while in between we have the long period of depletion therapy of medieval and renaissance medicine, and the orgy of purgation in an effort to keep the bowel empty and the body free from hypothetical toxins of a more recent period. Today there is a very general [illegible] more irritant sort, and it is [illegible] this attitude is well-founde[illegible] has not swung a little too far. That aperients are still being taken on a vast scale and often with little reason is certain. A more pertinent question lies in their possible harm.

Reliable figures of the incidence of the habit in the community are difficult to obtain. Parks tells me that among his Post Office employees he found that almost a quarter were taking aperients twice weekly or more often, and, as would be expected, there was an increase of the incidence with advancing years, reaching a maximum of 40% in the sixth decade. My inquiry into the bowel habits of healthy nurses showed that no more than 5% were taking aperients twice weekly or more often—a satisfactory figure and one reflecting no doubt their educational advantages.

Parks found that among the aperient-takers there were three groups—those who were afraid they might [illegible]

a stay in hospital, parental advice, or by minor ailments such as rheumatic pains. Among the nurses the prevention of constipation or lack of fruit in the diet were the chief reasons. The symptoms of headache, lassitude, furred tongue, and malaise often occur in association with constipation and have been widely attributed to bowel disorder. The theory of toxin absorption is of little more than historic interest, being disposed of by lack of any serious evidence in support and by much evidence against it. The more recent theory that the symptoms are due to distension of an over-loaded rectum and are nervous in transmission has some experimental support in the occurrence of very similar events in normal persons after filling the rectum with tow or distending it with a rubber balloon (Alvarez 1939). The symptoms disappear promptly when the pressure is lowered. Other observers (Hines et al. 1929) have not been able to confirm these findings, and it is difficult on this basis to account for exactly similar symptoms in constipation due to the sluggish type of colon in which the rectum and pelvic colon are apparently empty. I am little more impressed by the evidence of tow in the rectum than of toxins in the blood: I believe the symptoms are, in the main, psychoneurotic, [illegible] faulty education.

[illegible] from his series that the [illegible] was high, though only minor disturbances such as colic or morning diarrhœa resulted from their use. There is, no doubt, much ill-judged and unnecessary resort to aperients by the community which could be corrected by proper education in health matters. The regular use of an aperient is surely to be judged by its effect on colon function—if it assists that function as defined in this lecture well and good, but if it causes pain, wind, looseness of the stools or the passage of mucus it is to be condemned, however regular the result. The effects in colon neurosis illustrate the harm which may follow frequent and indiscriminate purgation.

Colon Neurosis

If we regard the basic motor disturbance of the colon in habitual constipation as a failure in transport or evacuation, in colon neurosis the failure lies in incoordination and results in instability of function without necessarily interfering with transport. Colon neurosis presents a characteristic though complex clinical picture, which was well-established before the introduction of the X rays. Radiology is of great value in these cases in the exclusion of disease; in the positive demonstration of functional pathology it has so far been less successful. The barium enema is unsuitable as a method for demonstrating functional pathology, since it necessitates an empty colon for its proper performance, while the variations met with in the passage of a barium meal make interpretation very difficult. The usual routine procedure of taking films at stated periods—24, 48 or 72 hours after a meal—gives a measure of progress, but otherwise shows no more than a momentary posture of the colon in a steady though slow procession of events. Stasis, whether in colon, rectum or both, may be revealed and areas of spasm demonstrated. On the other hand, repeated examinations may show an apparently normal colon.

In my own private records over a recent five-year period, I found that of 218 patients diagnosed clinically as colon neurosis, 121 were investigated radiologically, 85 with barium meals and 36 with enemas. Normal results were obtained in 28 meals and 21 enemas. Colon spasm was reported as present in 48 meals and 10 of the enemas. General colon stasis was present in 5, cæcal stasis in 1, and dyschezia in 3, one of which was associated with colon spasm. Diverticulosis was found twice, and diverticulitis three times. Confirmation of the clinical diagnosis was thus forthcoming in about half the cases, though great caution is always necessary in the interpretation of results. A film taken after a bowel movement may show a markedly diminished lumen due to a decreased content and may simulate the appearance of a contracted or spastic colon. There may be, too, a temporary absence of haustration in the proximal colon after a mass movement due to deficient filling, and until this is rectified there will be irregularities in the haustra and colon outlines. Extreme care is therefore necessary i[illegible] on a single film as [illegible]. To have significance [illegible] an area of spasm is [illegible]ent.

[illegible]cur if the contents [illegible] evacuated within [illegible]bitrary definition, [illegible]ne involving the whole colon and occurred in 53% of 1000 cases of colon stasis analysed by Spriggs (1930). Less often it is in the pelvic colon or rectum—29% in his series. General colon stasis, or the sluggish colon, is a common form of constipation occasionally referred to as hypotonic or even atonic. Such colons are stated to be wider than normal and to have special characteristics of haustration. I believe there is little justification for these refinements, and recent experiences with healthy medical students has convinced me that there are few so-called abnormalities of tone, haustration, and local spasm which cannot be demonstrated at one time or other, in one or other of a number of healthy folk. Apart from faulty transport these sluggish colons look normal from a radiological standpoint. In some the delay is due to pelvirectal dyschezia (O'Beirne's type of constipation), in others to a failure of the mass reflex, and in others to persistent spasm of the descending and pelvic colons. In cases of this type water-absorption continues, mucus is absorbed as the stimulus of movement is no longer present, and the stools are broken into fragments. Sigmoidoscopic examination shows a dry rectum with few folds, and a few shreds of coagulated mucus. Similarly such terms as colon spasm and spastic constipation are, I think, out of place in the terminology of these disorders. Constipation is certainly a misnomer, as the passage of barium is usually within normal limits. Areas of spasm and hypotonia may occur in the same colon at the same time or at different times, and the disorder is not solely one of tone. It is essentially a disturbance of coördination—a dyskinezia, or dyssynergia—with a general tendency to over-action, an effort syndrome of the colon, as it were, interfering with normal transport.

PATHOLOGICAL SIGNIFICANCE OF MUCUS

The passage of mucus in quantity is nowadays rare except in inflammatory diseases of the colon, when it is invariably accompanied [illegible] by blood. In a consecutive s[illegible] neurosis, mucus was passed [illegible] form of casts in 6 only. Mucus, as has been noted, is the normal response of the colon to activity and accompanies an increase in movement and blood-supply. Mucus is readily absorbed, and except for the small quantity which is mixed with the fæces little leaves the body under normal conditions. When present in excess it is the result of an exaggeration of the protective response to an abnormal stimulus, whether acting locally in the bowel, reflexly from other organs, or through the channels of emotion, the final common pathway in each case being the sacral division of the autonomic system. The term colitis applied to such conditions is not warranted either by the evidence of stool examination, sigmoidoscopy, or barium enema. Hyperactivity of the colon is associated with congestion of the mucous wall and an increase in the size of the folds which rely on mucus for their protection. Experimental evidence has been quoted suggesting that such abnormal activity long continued may ultimately lead to the exhaustion of mucus secretion and pave the way to structural disease.

This brings my survey of certain aspects of normal and abnormal activity in the large intestine to a close. I am well aware that I have explored no new territory; likewise there have been some unavoidable omissions. I have, however, endeavoured to give some account of those functions which I deem of primary importance to an understanding of the pathology of disorder. The art of medicine is urgent and cannot wait for the slower and surer advance of science, yet the need for the discipline of exact experiment and scientific reasoning is ever apparent and nowhere more so than in the field of gastroenterology. Between order and disorder, disorder and disease there remain large gaps, but I think there can be discerned, dimly perhaps as yet, a unity of design whereby anatomical end-results may be interpreted as the morphological expression of physiological processes.

(References at the end of Lecture II)

BATTLE CASUALTIES

TREATED WITH PENICILLIN

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THIS paper is based on the clinical impressions gained in the treatment of over 15,000 battle casualties which passed through an Emergency Medical Service hospital during the invasion of the Continent. A proportion of these cases (those sustaining certain definite types of severe wounds) had received adequate treatment with penicillin under the Medical Research Council penicillin scheme, and to further this work a special penicillin unit was attached to the EMS transit hospital through which these casualties passed, in order that special study could be made of the more severely wounded with particular reference to their response to penicillin therapy. Over 1500 cases were so examined, and the clinical observations recorded during their treatment are detailed in the hope that this account of the difficulties encountered may assist others beset by similar problems.

Detailed end-results are not available, because this hospital was on transit work until Nov. 1, 1944, and hence all patients who had finished their penicillin treatment and who were fit for transfer were at once moved on to a base hospital where further definitive treatment was carried out.

Our impressions were reinforced by the striking contrast between the clinical state of these casualties from the Continental invasion front, and that of the very similar wounded received and treated by us from the Dunkirk evacuation in 1940.

GENERAL FEATURES OF CASES UNDER PENICILLIN TREATMENT

Despite the presence of large flesh wounds and associated bony damage, often involving nearby joints, which operation had shown to be clinically heavily infected and/or associated with gross muscle damage or necrosis, and which had before treatment been exquisitely tender, the exhibition of penicillin resulted in early and complete freedom from pain. This striking feature of the treatment called forth considerable favourable comment from the several senior regional consultants who visited the ward, and who compared the condition of these men with their recollections of similar cases in the last war. From our own experiences with a series of convoys from Dunkirk, which contained cases comparable in severity with those received in transit from D-day and thereafter, we were most impressed by this comfort of [illegible] wounded men under penicillin treatment.

But a curious anomaly was noticed early in the treatment of these cases. Whereas the patients felt well, were cheerful with a good appetite, and slept easily, yet many of them at the same time looked very ill—the facies appeared pinched and the eyes and cheeks sunken, and the skin showed a slight icteric tinge and was very pale, these severely wounded cases being often persistently anæmic despite multiple whole-blood transfusions. Examinations over a long period showed that in estimating the patient's condition this facies could to a great extent be disregarded, except in so far as it was an indication of the anæmic state.

A second sign on which no credence could be based was a high intermittent pyrexia while treatment with penicillin was in progress. Such a fever, of the kind usually associated with acute pyogenic infections, occurred again and again in patients apparently well, whose wounds showed none of the signs of inflammation, and who were unaffected in general well-being by the raised temperature. In none of these cases were any other infective foci present which should cause such a rise, and as a rule the fever subsided after treatment with the drug was stopped. Indeed so regular was this return to a normal temperature after the withdrawal of penicillin that if the raised temperature continued the presence of a so-called "cold abscess" (or undeclared localised infection) was always suspected, and nearly [illegible]

[illegible] rring in cases having penicillin by serial discontinuous intramuscular injections this pyrexia was most definite in the cases [illegible] by continuous intramuscular or subcutaneous drip methods, using considerable quantities of saline as the vehicle; but the saline used was a standard manufactured brand, guaranteed pyrogen-free, and was administered with the standard pyrogen-free giving sets, as supplied by the makers, which had never previously given any reaction of this nature when used for intravenous infusions. The penicillin used throughout the transit work was manufactured by a single American firm. The following cases are not excessive examples of the pyrexia.

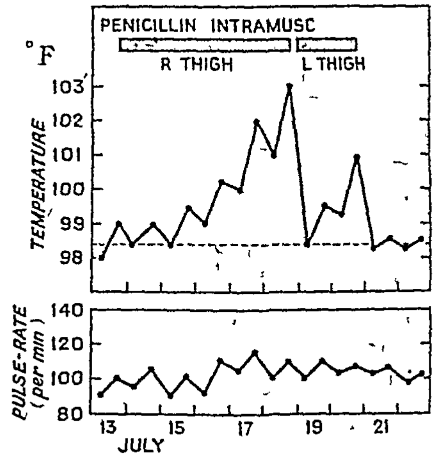

Fig. 1 (case 1).—Intermittent pyrexia during penicillin administration

CASE 1.—Admitted July 13; severe gunshot wound of abdominal wall and left flank; no visceral injury. ? Gas infection in wound. Penicillin given by intramuscular drip into thigh. Mounting pyrexia suggesting "typhoid state" (fig. 1).

July 18: patient comfortable; some œdema of right thigh; drip discontinued and reinserted into left thigh.

July 21: drip discontinued; wound clean.

CASE 2.—Admitted July 12; very severe compound comminuted supracondylar fracture of right femur, involving knee-joint, with complete rupture of quadriceps tendon Admitted 8 hours after injury, a modified debridement ha been carried out elsewhere, and the wound packed owing torrential hæmorrhage.

July 12: operation; wound opened, packing remo fracture reduced by skeletal traction through tibial tuber knee-joint closed, wound left open and packed with sulphanilamide and 'Vaseline' gauze; immobilised on T knee splint.

July 14: despite full doses of sulphanilamide, th was a gradual rise of temperature, and it was decided t use intramuscular penicillin by continuous drip method Thereafter, although the patient's general condition was go an alarming and rapid rise of temperature (fig. 2) sugges that a pyarthrosis of the knee was forming.

July 17: exploratory operation performed; knee-j appeared clean and normal, and wound appeared healthy [illegible] completely closed despite pyrexia. [illegible]

In none of these cases, typical of many we encountered, did the wound appear clinically to be responsible for the fever, and it is difficult to resist the conclusion that the penicillin, or more probably an impurity present in the manufactured product, was responsible for the pyrexia we observed. The pulse-chart proved a more reliable guide to the patient's clinical state, and the temperature was disregarded when unassociated with any well-marked increase in pulse-rate.

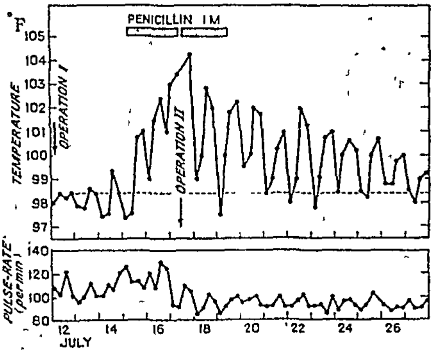

Fig. 2 (case 2) —High pyrexia beginning when penicillin was started; no apparent cause in wound

In all these pyrexial cases a pronounced local reaction [illegible] a spreading [illegible] of the intra- [illegible] arly definite in case 2, and here the gradual fall in the pyrexia coincided with the resolution of the reddened indurated area on the outer side of the thigh where the needle carrying the penicillin drip had been inserted.

In none was any infection proved to be present, and localisation and abscess formation at the site of injection was not seen *in any case treated in the hospital.* We are certain that this freedom from infection was due in a large part to the precautions taken by Dr. O. W. Morley, our pathologist, by whose department every individual dose of penicillin was prepared, and who was responsible for the strict bacteriological control exercised throughout the period under review on every aspect of penicillin therapy. Such bacteriological control must be continually maintained if penicillin is to be administered without the danger of serious infective complications.

Cold abscesses.—In some of these pyrexial cases, however, as already indicated, there was no remission after the withdrawal of penicillin, and here we had to recognise the presence of a complicating factor in treatment—the undisclosed so-called "cold" abscess which formed with none of the classical signs of inflammation, attention only being drawn to its presence after the cessation of penicillin, when all th [illegible] in acute localised infection wer [illegible] similar conditions have been [illegible] tates, in these battle casualtic [illegible] sed abscesses were nearly always found to contain a small foreign body (metallic fragment, "grit," &c.), causing a minute wound at the time of the major injury, unnoticed by the patient and rapidly healing, yet acting as a nidus of infection which, devoid of blood-supply, flared up after the restraining influence of the penicillin had been removed.

EFFECTS OF SYSTEMIC PENICILLIN ON LOCAL CONDITION

Up till May, 1944, we had treated several hundred battle casualties received from North Africa and Italy. Cultures from these wounds invariably showed hæmolytic streptococci, except in the few cases which had had penicillin, and these were uniformly free from this organism. It was exceptional to find hæmolytic streptococci in the wounds of penicillin-treated cases from Normandy, in which, perhaps by contrast, *B. proteus* and *Ps. pyocyanea* seemed unduly prevalent, and, according to a personal communication by Dr. Morley, the incidence of hæmolytic streptococci in all wounds was only 7%—this figure including all cases admitted, whether under penicillin or not.

In the cases not treated with penicillin before admission to this transit hospital, the systemic administration of penicillin immediately changed the appearance of the wound. With the rapid control of infection, œdema and induration subsided within 24 hours, and the tissues surrounding a previously grossly contaminated wound became soft, mobile, and painless. We have no doubt that the absence of local pain previously mentioned is largely due to the disappearance of the local inflammatory œdema around the wound, consequent on the rapid control of the infecting organisms.

The wound surface became pale and indolent-looking. Dead muscle remained *unaltered and attached to its* living continuation, separating more slowly than is usual in infected wounds; while the whole wound had an appearance suggesting that the tempo of the inflammatory changes had been slowed, and that a tissue equilibrium had been rapidly reached between the opposing forces of destruction and repair. Little granulation [illegible] in edges quickly became [illegible] deep fascia, the wound [illegible] being sealed off by a firm, jelly-like fibrinous material which yet allowed easy separation with little bleeding by blunt dissection at operation.

Although quiescent in appearance these wounds showed little apparent change in the rate of progress of the epithelial edge, except in so far as dead tissue impeded the inward growth of the epithelium. Many of the larger wounds had a peculiar smell, reminiscent of a mixture of mouse and decayed meat; we consider that this smell is *in part an indication of the presence of penicillin in* the tissue exudate from the wound surface.

Penicillin can neither pass the barrier of the synovial membrane of joints nor enter the pleural or peritoneal cavities, and it is excluded by the meninges from the cerebrospinal fluid. While recently wounded joints containing fresh blood may possibly be protected by systemic penicillin, this does not hold once the joint is walled off (6–8 hours), and the same is true of the major serous cavities of the body. Therefore infected joints were treated by injecting penicillin into the joint cavity after suture of the capsule (or of the skin if no capsular tissue remained) the extrasynovial tissues being protected by systemic therapy; the same held good for wounds of the chest-wall involving the pleural cavity, and to a less extent for wounds of the peritoneal cavity, in which the prevailing bacteria are less affected by penicillin and may actually destroy the drug by the elaboration of penicillinase.

DIFFICULTIES IN CLINICAL ASSESSMENT

Penicillin has made no difference to the paramount importance of early and adequate surgery. It has, in addition, produced new difficulties in that the effect of penicillin on contaminated wounds obscures the extent of the infection of the tissues, and makes it difficult to judge how radical surgery should be.

The usual criteria of inflammation and localisation of infection could not be applied in these cases, and apart from the anomalies in the general state *already described* it was difficult to know how radical an operation should be performed on wounds which were completely quiescent, discharging only a thin sero-pus, showing no signs of induration or evidence of localisation and not tender; yet exhibiting tags of obviously necrotic muscle and giving off a smell of decaying meat. Culture of such wounds rarely showed any hæmolytic streptococci or staphylococci, but *B. proteus*, *Bact. coli*, and *Ps. pyocyanea* were very common, often associated with anaerobes of the clostridial group, especially if *the initial surgery* had been inadequate, and there were pockets of dead tissue, and foreign material buried in the wound depths.

Inadequate forward surgery may be masked by penicillin, and one of the dangers which must be guarded against is this "masking" effect of the drug, the result being that the patient is passed rapidly along the lines of communication apparently comfortable, but in reality very ill, without his true condition being recognised by hard-pressed medical officers. The following are two examples of severely wounded men whose comparative comfort was evidently misleading.

CASE 3.—Aged 25. Shell wound of left buttock at 7.30 AM on July 20. Comminuted fracture of left ischium and pubis. At 2 PM wound explored at CCS. Packed after debridement (no note about foreign body). Blood from urethral meatus. No blood in rectum. Catheter could not be passed. Laparotomy showed no intraperitoneal lesion; no rupture of bladder or rectum. Suprapubic cystotomy with drainage of extravesical tissues suprapubically. Penicillin therapy begun.

July 24: condition fair.

July 26: evacuated to general hospital; general condition fair; on penicillin.

July 27: on hospital carrier; condition satisfactory.

July 28: admitted to transit hospital at 3 AM. Still on penicillin. Condition grave; delirious; incontinent of fæces. Temperature 99° F, P 120, BP 100/60. Laparotomy wound healed. Suprapubic wound heavily infected but draining. Subcutaneous crepitus over whole of lower abdomen, more pronounced on left, and extending down into left thigh and scrotum. Large wound of posterior aspect of thigh down to bone exhibiting green necrotic muscle, and continuous with an infected cavity in the region of the left obturator foramen. Complete division of sciatic nerve. After 2 pints of plasma and 1 pint of blood abdominal wall and pelvis drained by multiple incisions, leg being rapidly amputated subtrochanterically and flaps left open to assist in drainage of pelvis through adductor region. Patient died 2 hours after operation despite further transfusion.

Autopsy: very large fragment of metal lying in site of prostate, with complete severance of bladder neck and gross extravasation and infection of pelvic cellular tissues—scrotum and abdominal wall.

Comment.—While this is an extreme case, there are grounds for supposing that the penicillin masked the infection, and so concealed the urinary extravasation from the medical officers through whose hands the patient passed that when the condition was recognised extravasation was too extensive, and toxæmia too advanced, to allow of any drainage measures being effective.

CASE 4.—Aug. 20: right leg crushed by tank; severe compound comminuted fracture of tibia. Debridement performed within 8 hours at CCS. Considerable muscle damage in posterior compartment of calf. Immobilised in padded above-knee plaster.

Aug. 23: in hospital carrier; comfortable; toes warm.

Aug. 24: admitted to transit hospital; comfortable; on intramuscular penicillin. Considerable discharge through plaster, which was somewhat offensive. Toes good colour, movement fair, no sensory loss. Condition good.

Aug. 26: general anæsthetic for change of plaster. Plaster removed, whole of skin over posterior 2/3 of calf necrotic, along with subcutaneous fat. Gastrocnemei and deep flexor muscles represented by deliquescent necrotic mass containing numerous gas bubbles, and greenish to dark brown or black. Immediate amputation performed through knee-joint with ablation of gastrocnemius heads from femur, leaving skin flaps stitched back.

Convalescence was satisfactory. Examination of amputated limb showed[1]—*Macroscopically*: skin ablated from posterior aspect from deep fascia down to middle of calf; gastrocnemius and soleus separated from one another; flexor communis digitorum separated from its origin and crepitated; foot black and swollen; escaping blood full of bubbles. *Microscopically*: acute inflammation with necrosis of muscle.

Comment.—In this case, again, a serious condition was present in a patient who was very comfortable, and whose wounds, concealed by plaster, gave no clinical evidence of the severity of the infection or the injury. This case might have progressed to a state like that in case 3 if removal of the plaster had not disclosed the gross muscle infection present.

There have been other instances where patients already under penicillin when admitted to the hospital showed signs of acute and severe inflammation at the wound site 48 hours after cessation of penicillin treatment.

Operation invariably disclosed a fragment of metal—often with clothing around it, and/or necrotic muscle—and there is no doubt that infected organic material not possessed of a blood-supply, be it muscle or sequestered bone, is not affected by penicillin, infection thereupon supervening when the drug in the tissues falls below a certain minimum level. The ill effects of inadequate forward surgery—rare as it was—were not mitigated but merely delayed by penicillin, and the result was a flare up of infection in a previously quiescent wound, or the disclosure of a previously "cold" abscess on the withdrawal of the drug.

This masking effect of penicillin is a real danger in a war of movement, and in our view patients suffering from injuries, for which they would have been retained for observation before the discovery of penicillin, should not be moved because they appear comfortable under the anti-infective influence of the drug. If they have to be moved owing to overriding military considerations, then particular care must be taken at each transit sta to examine fully cases of such severity, even though tl patient's general well being may suggest that all is we

SUTURE OF WOUNDS: THE COMPOUND FRACTURE

Casualties admitted to the unit within a week wounding, having received penicillin throughout tl period, showed comparatively few pathogenic organisı in wounds not frankly suppurating; but the longer t wound remained open the more common became t non-penicillin sensitive organisms such as *B. protei* *Bact. coli*, or *Ps. pyocyanea.*

Delayed primary suture—i.e., a simple closure of t wound without extensive dissection—was found particular value, especially in compound fractur during the period when staphylococci and streptoco were controlled by penicillin, but other organisms we not yet excessively numerous. Instillation of penicill through fine tubes inserted into the wound was ea discarded, because in our hands this method gave i different results. The most satisfactory method w found to be the use of a mixed penicillin-sulphonami powder (penicillin 200 units: sulphanilamide 1·00 g This powder was insufflated into all parts of the wou and the tissues were drawn together using tension sutu passing through all layers in an endeavour to oblitera all dead space. A five-day course of systemic penicill was used in extensive wounds, and a "boost dose" 50,000 units injected systemically in less severe and le heavily infected wounds.

It was an advantage if suture could be performed this early stage, not only because of the absence secondary contaminants in the bacterial wound flora b also because closure could be accomplished by sim blunt dissection without extensive mobilisation relaxation incisions, and hence with little bleeding fr the wound site. This prevented loss of penicillin by t mechanical washing away of the powder, a factor whi had to be considered in performing later seconda suture, where mobilisation and relaxation were general necessary.

In such cases penicillin-resistant organisms we already present in large numbers, and we found th sound healing was encouraged by drainage of the wou from the most dependent point after suture; oft through a separate incision. Here the systemic pe cillin was used to prevent any cellular spread by t always potentially active streptococcus or staphylococc while a thorough insufflation of the wound crevices wi sulphanilamide powder to a considerable extent co trolled the penicillin-refractory organisms.

Fractures in which sepsis was controlled and t wound closed in this manner did not sequestrate in spi of comminution, and dense and apparently avascul fragments of bone could be seen a few weeks later X-ray examination to be surrounded by new bone a were subsequently revasculanced to form part of t reconstituted and united bone. We are of the opinio in view of these results, that the previous teaching that loose fragments of bone should be removed fro compound fractures—must be modified in cases in whi early and continuous protection by penicillin is availab to prevent the development of severe sepsis and allo delayed primary suture.

Serial X-ray examinations in the few cases studi for a sufficient period seem to show a greater and more rapid formation of callus than would have been expected from previous experience of similar fractures. It does not appear however that the consolidation of such callus is accelerated.

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[1] Our thanks are due to Prof. W. D. Newcomb for this report.

Amputation stumps, left open at the original operation owing to the presence of gross sepsis, were treated by secondary suture, bone and muscle being trimmed, and skin tension relaxed by mobilisation and dissection. Again, penicillin-sulphonamide powder with an associated protective systemic administration of a single boost dose at the time of operation resulted in healing by first intention in a high percentage of cases. Drainage was always employed in wounds heavily contaminated with organisms insensitive to penicillin.

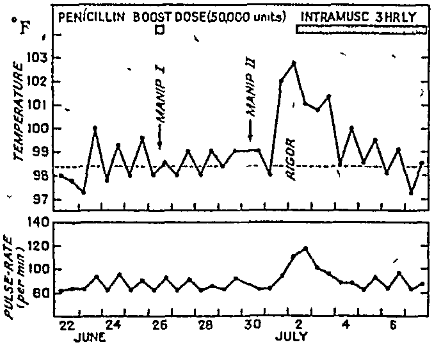

Fig 3 (case 5)—Use of large boost dose of penicillin before interference with wound

SYSTEMIC BOOST DOSE OF PENICILLIN

An important technique which was extensively used, and has been of the greatest value, is the single systemic dose of 50,000 units of penicillin—the so-called "boost dose"—immediately before any procedure involving the disturbance of an infected wound or manipulation of an infected fracture.

It has always been recognised that the late manipulation of infected fractures is dangerous, often leading to a spread of the local inflammation, and sometimes to a generalised infection. A single dose of penicillin of the magnitude of 50,000 units appears to afford protection for a sufficient time to enable any breach of the localising tissues, caused by the manipulation, to be repaired, and hence any spread of the inflammatory process to be avoided. The action of such a boost dose is well illustrated in the following case.

CASE 5—(fig 3). Compound fracture of middle third of humerus during the fighting in Normandy due to shell fragment.

June 22: admitted to transit hospital. Arm painful, though immobilised in thoracobrachial cast, and pyrexia suggested presence of inadequately drained septic infection.

June 26: boost dose of penicillin. plaster removed under general anæsthesia, several loculated cavities opened and drained; replaster after packing with SVG Condition satisfactory; temperature subsided.

June 30. X ray showed that position of humeral fragments was unsatisfactory and manipulation was carried out under anæsthetic followed by further immobilisation in corrected position.

July 1: within 24 hours patient's temperature rose rapidly, and he had a severe rigor, becoming seriously ill. Rapid exhibition of penicillin terminated all signs of impending septicæmia, and an uneventful convalescence followed, the temperature falling to normal limits within 5 days.

This replacement of a spatially limited cellular activity, physiologically the localising agent in any acute inflammatory process, by a chemical barrier (even though a barrier to certain specific bacteria only) limitless in extent and pervading all the tissues of the organism is one of the most important features of the action of penicillin and opens up possibilities of surgical treatment in cases where previously it could not have been considered, though most needed, owing to the fear that tissue resistance would be broken and a localised infection became a generalised septicæmia. This chemical barrier to infection is only present while the blood and tissue concentrations of penicillin are above a critical level, and the excretion of the drug by the kidney is so rapid that for all practical purposes the period of protection from a single adequate dose lasts only 3–5 hours.

Although evanescent, this protection is of great value, and the boost dose of penicillin (50,000 units intramuscularly) immediately before an operative procedure in the presence of sepsis has become a valuable adjunct to surgical treatment, and indeed has opened up revolutionary possibilities of early definitive treatment in the grossly infected case.

One of the outstanding features of the cases passing through this hospital since D-day has been the absence of a single case of septicæmia or pyæmia due to a streptococcal or staphylococcal wound infection, whereas previous experience with wounds of this type and severity had led us to expect a number of deaths from this cause.

FATAL CASES

Despite the fact that the figures include deaths in cases of the greatest severity (sent to the orthopædic spinal and peripheral vascular units attached to this hospital), the total mortality (22 out of 15,561 admissions) is in our opinion very low, and an examination of the causes of death discloses a rarity of pyogenic infections. The figures do not include cases admitted to the Plastic Unit, which did not pass through our admission system.

	Cases admitted	*Amputations*	*Deaths*
British and Allies .	13,336	.. 27 (0·2%)	13 (0·1%)
Prisoners of-war ..	2,225	.. 11 (0·5%)	. 9 (0·4%)
Total .. .	15,561	.. 38 (0·25%)	.. 22 (0·14%)

CAUSES OF DEATH

1. Laceration of both kidneys
2. Gross injury to pelvis, bladder, and rectum. Gas infection of retroperitoneal tissues
3. Paraplegia, gunshot wound (GSW) of spine.
4.* GSW of shoulder; brachial artery injured Amputation of arm. Ruptured internal mammary artery with intrapleural hæm.
5.* Crushed by falling tree, crush syndrome
6. Penetrating GSW of left shoulder into pleura and lung. Bronchopneumonia.
7. Amputation of left leg GSW of thigh; arterial injury and gas gangrene. secondary hæmorrhage
8. GSW of chest Pneumonia.
9. Penetrating injury of chest. Sudden severe intrathoracic hæmorrhage
10. GSW of spine; uræmia; paraplegia
11.* Amputation of right leg before admission; secondary hæmorrhage Death in theatre.
12. GSW. Paraplegia; bed sores, toxæmia, cachexia.
13. Appendicitis (gangrenous), suppurative pylephlebitis.
14.* Fracture dislocation of cervical spine; quadriplegia; pneumonia.
15.* Bronchitis, pulmonary œdema GSW of wrist.
16.* Penetrating wound of abdomen Peritonitis.
17.* GSW. Paraplegia. Mediastinal abscess.
18 GSW. Fractured femur in upper third. Acute cholangitis and hepatitis with liver necrosis.
19. GSW of right thigh. Fractured upper third of femur; perforating injury of bladder. Empyema of gall-bladder. Pneumonia
20.* Tuberculosis (generalised).
21. GSW of right femoral head; fractured sacrum. Intra-abdominal GSW. Peritonitis.
22. Paraplegia from GSW of spine.

* Prisoners-of-war.

SUMMARY

The clinical experiences gained in the treatment with penicillin of over 1500 severely wounded men (selected from 15,561 invasion casualties) have been surveyed.

Several misleading symptoms and signs were noted in successful cases—some looked very ill, though they were comfortable and seemed and felt well; others ran a protracted fever without local sepsis or general malaise or signs of sepsis, and these were thought to be instances of reaction to penicillin.

Protracted fever which continued after penicillin had been stopped was most commonly the result of "cold" abscesses around foreign bodies.

The clinical assessment of cases under penicillin therapy is difficult, and the drug has a masking effect on severe cases in transit; great care is required in the examination of such cases on the lines of communication.

Penicillin does not lessen the need for adequate forward surgery, but merely delays the onset of symptoms.

The delayed suture of wounds using penicillin-sulphonamide powder is described, with particular reference to the treatment of compound fractures.

A boost dose of 50,000 units of penicillin is a useful preliminary to manipulation of infected wounds or fractures.

We would like to thank Dr. Morley, the pathologist in charge, and the surgeons on the staff of the hospital—Mr. B. C. Maybury, Mr. H. H. Langston, Mr. J. A. White, Mr. A. H. Hunt, Mr. J. S. Ellis, Mr. C. P. Sames, and Mr. D. O. Williams—for their cooperation.

EFFECTS OF SULPHONAMIDES ON BONE PHOSPHATASE *

P. H. SILVER J. S. R. GOLDING

STUDENTS IN THE DEPARTMENT OF PHYSIOLOGY, MIDDLESEX HOSPITAL MEDICAL SCHOOL

THERE is an impression among some surgeons that, in spite of decreased local sepsis, the rate of repair of open fractures is less rapid than might be expected. In considering the various factors that might be responsible for delayed union, it occurred to us that the sulphonamide drugs which are commonly introduced in high concentrations at the fracture site might hinder normal bone repair. There is accumulating evidence (Folley and Kay 1936, Botterell and King 1935) that the phosphatase of bone plays an essential rôle in normal bone formation and probably also in bone repair. We decided to study the action of sulphonamides and related substances on bone phosphatase; observations were made in vitro and by histochemical methods. Some preliminary results of Blum (1944) in this laboratory suggested that sulphonamides might inhibit bone phosphatase in vitro.

Chemical Methods

Initially phosphatase activity was determined by the King and Armstrong method (1934). It consists of incubating disodium phenyl phosphate at pH 9 2 with phosphatase; phenol is split off and determined colorimetrically by the blue colour given with the Folin-Ciocalteau reagent. Sulphonamides were added to produce concentrations comparable to those that might be present in wounds packed with these drugs (Hawking 1941). The maximum concentrations used were: 2000 mg. per 100 c.cm. for sulphanilamide; 250 mg. per 100 c.cm. for sulphathiazole and sulphapyridine. The phosphatase concentrations employed in the reaction mixture were up to 50 King-Armstrong units.

It was found however that the sulphonamides themselves produced a blue colour with the Folin-Ciocalteau reagent, which invalidated the result of the phosphatase determination. It was decided therefore to determine the phosphate liberated from the disodium phenyl phosphate substrate instead of determining the phenol. The method of Fiske and Subbarow (1925) was used to determine phosphate and found to be satisfactory.

RESULTS OF IN-VITRO EXPERIMENTS

The results are illustrated graphically in fig. 1

(1) *Sulphanilamide.*—The maximal blood concentration of this drug usually produced clinically is 10 mg. per 100 c.cm. At this concentration sulphanilamide has a negligible depressant action on phosphatase in vitro. The maximal concentration that can be produced in tissues packed with the drug is 1500 mg. per 100 c.cm. At this concentration the degree of inhibition of phosphatase is over 55%. The inhibiting action rapidly increases at first, so that with 100 mg. per 100 c.cm. the inhibition is 25%, with 200 mg. it is 35%, with 300 mg. the inhibition is 40%, and then there is little additional increase in inhibiting action with further large increments of sulphanilamide concentration.

(2) *Sulphanilamide + 5% zinc oxide.*—This preparation is made commercially and is recommended by the manufacturer for local application. The mixture had a somewhat greater inhibitory effect on phosphatase than sulphanilamide alone (Hove et al. 1940), especially in the lower range of concentration. Thus the degree of inhibition at 100 mg. per 100 c.cm. was 35%, at 200 mg. it was 45%, and at 300 mg. 50%. At 1500 mg. per 100 c.cm. the inhibition was only slightly greater than with sulphanilamide alone.

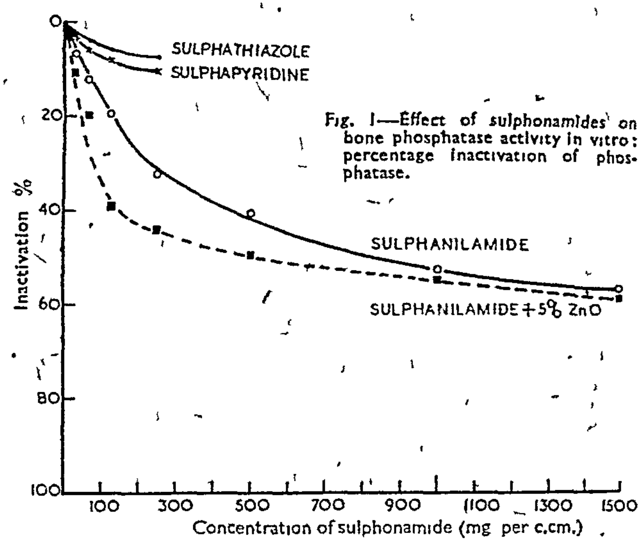

Fig. 1—Effect of sulphonamides on bone phosphatase activity in vitro: percentage inactivation of phosphatase.

(3) *Sulphathiazole and sulphapyridine.*—The maximal blood concentration generally produced with these drugs is 6–8 mg. per 100 c.cm. The maximal concentration that can be obtained in tissues is about 250 mg. per 100 c.cm. At blood concentrations the inhibitory action on phosphatase is negligible, and even at 250 mg. per 100 c.cm. it is under 8%.

(4) *Para-aminobenzoic acid.*—In cultures aminobenzoic acid inhibits the bacteriostatic action of sulphanilamide, so we thought it might have a similar influence on the action of sulphanilamide on phosphatase. Preliminary experiments demonstrated however that *p*-aminobenzoic acid itself had a potent inhibitory action on phosphatase. Fig. 2 shows that with concentrations of *p*-aminobenzoic acid up to 500 mg. per 100 c.cm. there is an approximately linear relationship between the concentration and the degree of inhibition of phosphatase obtained; 500 mg. per 100 c.cm. produced almost 90% inhibition.

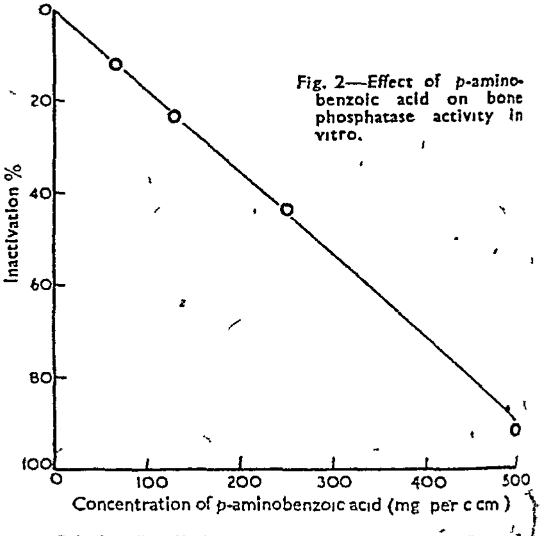

Fig. 2—Effect of *p*-aminobenzoic acid on bone phosphatase activity in vitro.

INFLUENCE OF PHOSPHATASE CONCENTRATION

Over the range of phosphatase concentration in the reaction mixture of 10–50 King-Armstrong units, the concentration of phosphatase did not influence the degree of inhibition produced. The concentration of phosphatase in bone is unknown; it is not uniformly distributed but is highly concentrated in certain zones, as shown by histochemical studies.

Histochemical Methods

Phosphatase can be demonstrated by histochemical methods in tissues that have been fixed and embedded in low melting-point paraffin in the usual way, as shown by Gomori. The later method of Gomori (1943) was found more satisfactory for studies on bone. The principle of the method is as follows:

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* The results here reported were demonstrated to the Physiological Society on Nov. 25, 1944.

> The calcium salt present in the bone section is dissolved out and topically replaced by a precipitate of black cobalt sulphide. The section is then incubated with calcium chloride and sodium glycerophosphate. The phosphatase in the section liberates calcium phosphate, which is precipitated in the presence of veronal buffer. The calcium phosphate is converted into lead phosphate and stained specifically with acridine red. Phosphatase distribution and concentration are assessed by the distribution and intensity of the red colour.

To determine the action of the sulphonamide on phosphatase in bone the following procedure was adopted.

> Femora of day-old rats were fixed in absolute alcohol without preliminary decalcification, embedded in low melting-point wax and cut longitudinally. The sections were treated by the method outlined above, up to the stage of replacing the calcium salt of bone by black cobalt sulphide. Contiguous sections were then used; one of the pair acted as control and was put through the usual stages of the later Gomori method. The treatment given to the other member of the pair was modified. The section, instead of being incubated in calcium chloride and sodium glycerophosphate alone, was incubated in a calcium chloride + sodium glycerophosphate solution to which a sulphonamide was added in the maximal concentrations that can be produced in tissues. Incubation was carried out for 6 hours at 37° C, during which period the sulphonamide could exert its influence on the phosphatase activity of the bone. The Gomori procedure was then completed as in the controls. Exactly comparable parts of contiguous sections were examined.

In the descriptions that follow the depth of the red colour in the various parts of the section is taken as a measure of phosphatase concentration.

RESULTS

(1) *Normal distribution of phosphatase.*—In the region of the epiphyseal line, the hypertrophic cartilage cells were stained moderately red while the matrix between them was stained very deeply. As explained above, using the method employed, the preformed calcium salts of the bone are stained black. The osteoblasts in the cancellous bone of the metaphysis were stained as deeply red as the hypertrophic cartilage cells. The cells and matrix of the periosteum covering the shaft and extending up to the joint capsule were very deeply stained—i.e., to about the same degree as the matrix between the hypertrophic cartilage cells

(2) *Effects of sulphonamides.*—The distribution of [illegible] the red staining was the [illegible] All parts of the sections [illegible] (at concentration of 1500 mg. per [illegible] indicative o[illegible] decrease in t[illegible] in phosphatase activity) was noted in the sections incubated with sulphapyridine or sulphathiazole in concentrations of 200 mg. per 100 c.cm.

Comment

[illegible] sulphathia[illegible] produced [illegible] significantly inhibit bone phosphatase. On the other hand, sulphanilamide under the same conditions produces a well marked inhibition of bone phosphatase. Hawking (1941) has shown that the local concentration of sulphonamide in a packed wound [illegible] and that the concentration i[illegible] after 36 hours. We do not kno[illegible] the inhibitory effect originally [illegible] phosphatase by sulphanilamide [illegible] we no evidence that sulphanilamide as used clinically does in fact play any part in retarding bony union, but we suggest in view of the results obtained that it might be wise to avoid the local use of sulphanilamide in the presence of a fracture.

Since the completion of this work, Benesch, Chance, and Glynn (1945) have reported that when pregnant rats are given large doses of sulphanilamide or sulphapyridine by mouth the fœtuses at term show defective calcification of certain bones. Reasons are given for not attributing these results to inhibition of carbonic anhydrase and the suggestion is made (based on a misinterpretation of our experimental findings which are referred to) that the changes described are due to direct inhibition by the drugs of the phosphatase of bone. No evidence is given that in fact bone phosphatase was inhibited. The doses of sulphonamide employed are stated to be "about seven times the therapeutic dose," but no data are given for blood sulphonamide concentration, which may perhaps have been as high as 70 mg. per 100 c.cm. In our experience sulphapyridine in this concentration [illegible] tion on bone phosphatase. [illegible] the defective calcification [illegible] olleagues can be explained

Summary

In the maximal concentrations obtained clinically in the blood, sulphanilamide, sulphapyridine, and sulphathiazole produce no inhibition of bone phosphatase in vitro or in sections.

In the maximal concentrations obtainable in tissues as a result of local application sulphanilamide produces over 50% inhibition of bone phosphatase activity; sulphapyridine and sulphathiazole on the other hand produce only slight inhibition.

It is suggested that sulphanilamide should not be used clinically as a local application at fracture sites.

We would like to thank Mr. W. B. Emery and Mr. W. G. Bartley for supplying us with bone phosphatase; Mr. C. L. Foster for assistance in preparing the histological material; and especially to Prof. Samson Wright and Dr. D. Slome for their continual encouragement.

The expenses of this research were defrayed by a grant from the Medical Research Council to Prof. Samson Wright.

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DERMATITIS FROM CUTTING OILS

G. P. B. WHITWELL, M.D. LOND.
WORKS MEDICAL OFFICER

In 1943 I noted[1] that not all cutting oils are [illegible] harmful to the skin in producing dermatitis, [illegible] rejected the theory that oil acne was due to me[illegible] mechanical blocking of the skin follicles. I consid[illegible] that chemical irritation was the primary cause.

It seems that some oils produce much oil acne and [illegible] but little; and this cannot, to my mind, be [illegible] with any physical property of the oils. Might not [illegible] position be comparable to the fact that some c[illegible] ? Furthermore, [illegible] annot be explained [illegible] of the skin follicle[illegible]

I found that non-soluble cutting oils that [illegible] thinned with paraffin produced severe oil acne, [illegible] s produced [illegible] soluble [illegible] matoid ras[illegible] the latter did not in fact go beyond the [illegible] stage. From this, it seems possible that [illegible] irritating (oil-acne-producing) and eczemat[illegible] dencies of an oil run parallel. The thick he[illegible] oils do not necessarily produce the most oil acn[illegible] in theory these oils should block the pores mos[illegible] On the contrary, they are often relatively [illegible] Thus some thick purified medicinal greases, [illegible] from petroleum, such as yellow or white pet[illegible] never give rise to oil acne; and an oil acne f[illegible] ointments must be practically unknown. [illegible] petroleum jelly is incorporated with certain tars, to [illegible] a tar ointment, folliculitis quite often follows its us[illegible] the same sort of way relatively harmless olive oil can produce oil acne when it is camphorated and used as a liniment. Pure olive oil was safely used for skin hygiene by the ancient Greeks.

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[1] Whitwell, G. P. B. *Lancet*, 1943, ii, 354.

The better-quality lubricating oils are much less liable to produce skin trouble than some of the cruder cutting oils. In a big aero-engine assembly plant, employing several hundred people, the engine parts were bathed in lubricating oil of good quality, and this often soiled the skin of employees; but in two years I saw no case of oil acne or dermatitis. The aero-engine test-house operators numbered nearly 200 and lived in a thin film of oil which was spun off the engines on to the walls and all surrounding parts. The floors, stair rails, and every object felt oily to the touch, and the smell of hot oil was overwhelming. The operators had to clamber over the engines a great deal during the testing. Yet again, this high-quality lubricating oil produced no cases of oil acne during two years. From the nearby machine shop, where operators used the cruder cutting oils, new cases of oil acne would arise daily, especially in the summer.

Recently I have been in touch with a group of garages employing 140 men. The management have no record of an oil rash for the last five years. A small outbreak of dermatitis six years ago was due to a group of employees cleaning their hands with paraffin and sawdust. These garage men ordinarily handle lubricating oils, greases, and paraffin for spring spraying, &c. No diesel or crude oils are handled.

It is the opinion of one firm which deals in oils that the skin-irritating property of oils is due to "organically combined hydrocarbon sulphonates" and "ichthyol present as organic sulphonate." On the basis of this, they claim to have produced a non-irritating cutting oil. However this may be, it is likely that research by the oil industry and industrial chemists could do much to end this trouble. I do not contend that all lubricating oils are harmless and all cutting oils harmful; it is more a matter of tendencies. Nor do I believe that the only way to make cutting oils irritating to the skin is to add paraffin (or the irritating chemicals it may contain); but it is certainly one very common way. It is possible that the objectionable practice of thinning cutting oils with paraffin would often become unnecessary if the advice of the oil industry or of technical experts was obtained. Paraffin is messy, carries a fire risk, and is unpleasant to work in. Severe oil acne and eczematoid rashes develop in those engaged in paraffin degreasing—in the course of which components are freed of oil in a paraffin bath. This degreasing is done manually and is a deservedly unpopular job in works. A little ingenuity might make even this job pleasanter and free of risk.

It is worth noting that liquids other than the common oils are sometimes used as cutting liquids; for example, strong soda solution, which occasionally produces a dermatitis. Castor oil, coconut oil, and palm oil are sometimes seen, but workers in castor oil state that they acquire a very fine and supple skin texture.

Lastly, why do some persons get a folliculitis from oils, and others an eczematoid dermatitis? A hairy skin seems liable to folliculitis but I have not noted any relationship of seborrhœa with oil rashes. Some races, such as American negroes, are naturally seborrhœic, yet they seem to have a comparative immunity to trade dermatitis, including oil acne. On the other hand, I have seen people with severe acne vulgaris whose acne has been made much worse by an oily job, but they did not seem specially liable to oil folliculitis on forearms and thighs. Seborrhœa alone, unaccompanied by acne vulgaris, seems to be no bar to an oily job.

SUMMARY

Oil acne is due to irritating chemicals in the oil. Chemical research might do much to make oils less harmful to the skin. The relationship of oil folliculitis to seborrhœa and oil acne is discussed.

POLISH AWARDS.—*The King has given permission to Sir* John Fraser and Prof. L. S. P. Davidson to wear the decorations of the order of Polonia Restituta (second-class and third-class respectively) conferred on them by the President of the Republic in recognition of services during war.

LOCAL INSTILLATION OF PENICILLIN IN LUNG ABSCESS

DENNISON PICKERING
M D CAMB.

RONALD GRENVILLE-MATHERS
M B CAMB., PH.D., A R I C

Pendyffryn Hall Sanatorium, Penmaenmawr

INTRAMUSCULAR infusion seems to be the best method of systemic penicillin therapy (Fleming et al. 1944). In many cases, however, local application gives better results and is more economical. In lung abscesses it is unlikely that an adequate concentration of penicillin reaches the cavity when administration is systemic, and this accounts for failures (May 1944). The following case of racemose lung abscess was treated on two occasions with systemic penicillin and later by introducing penicillin directly into the cavity.

CASE-HISTORY

The patient, a man of 40, was treated for pleurisy in May, 1944. Four days afterwards he had a sudden violent pain in the right side of the chest posteriorly, followed suddenly 2 weeks later by the appearance of copious, dark, foul sputum. There were scattered rhonchi in the right lung with prolonged expiration, and X rays showed diffuse shadows in the upper part of the lower lobe. At the end of June the illness became more acute and there were several hæmoptyses; radiography showed irregular translucent areas, and a diagnosis of bronchiectasis was made. Penicillin, 450,000 units, given intramuscularly over 4 days checked the hæmorrhage, and the general condition improved. In September further hæmoptyses were checked by penicillin, but the general condition remained poor. The offer of surgical intervention was rejected, but on Oct. 12 the patient came to Pendyffryn Hall Sanatorium, Penmaenmawr, with a view to surgery later.

On admission his general condition was very poor. Temperature 100–102° F, pulse-rate 100–112, respiration-rate 28. Cough severe; sputum foul and purulent. Greatly diminished movement at the right base, dullness on percussion, very poor air-entry, and numerous coarse râles. Blood count: red cells 3,500,000; Hb, 68%; white cells 15,100; polymorphs 86%, monocytes 4%, lymphocytes 8%, eosinophils 1%, basophils 1%. Sputum: pus cells; predominating organism, *Streptococcus viridans*; also present, *Neisseria catarrhalis*, occasional pneumococci, anaerobic fusiform bacilli, and two strains of streptococci. Penicillin-sensitivity tests showed all the streptococci to be sensitive, but the *catarrhalis* resistant. On radiography there was dense mottling in the upper part of the right lower zone with several translucent areas apparently round the dorsal bronchus, and great thickening of the interlobar fissure.

The history was typically one of lung abscess as since described by Barrett (1944), and a diagnosis of pneumonitis with a racemose abscess round the dorsal-lobe bronchus was made.

During the first 24 hours the patient had two considerable hæmoptyses; his condition was desperate. Systemic penicillin had had no lasting effect at a time when spontaneous resolution was more likely; and, as two courses had been given, the "persister" effect of Bigger (1944) could be ruled out. The reason for failure, we thought, was that the penicillin had not reached the cavity, and we therefore decided to introduce it directly by transpleural puncture. Accordingly a lumbar puncture needle was inserted through the 7th rib space posteriorly, 2 in. from the midline. At a depth of 8 cm. thick pus was found. As much as possible (5 c.cm.) was aspirated and 20,000 units of penicillin injected in 5 c.cm. of solution. The effect was remarkable; within 5 hours the temperature had fallen to 98·6° F, the pulse to 88, and the sputum was less purulent.

On the following day exploration was made 3 in. further out from the midline. Pus was found at a depth of only 3 cm. and a further 20,000 units of penicillin was injected. *Examination of the pus showed considerable numbers of* gram-positive and gram-negative fusiform bacilli. No growth was obtained (unfortunately no penicillinase was available). The pus gave a 1 mm. zone of inhibition of standard staphylococci. The penicillin had evidently spread through the system of cavities, thus confirming our view that we were dealing with a racemose abscess communicating with the dorsal-lobe bronchus.

For six consecutive days injections of penicillin were given. Examination of the pus then showed: pus cells; moderate numbers of degenerate looking cocci; some gram-positive fusiform bacilli. There was no growth on culture. With the agar-cup technique the pus gave a slightly larger zone of inhibition than penicillin, 10 units per c.cm.

At this time, then, the infection in the abscess was under control, and it was decided to give penicillin on alternate days only. Unfortunately, after another X ray examination [illegible] 2 days. The pus showed no change. The general condition now improved; temperature and pulse became normal, and the patient gained 6 lb. in 4 weeks.

The abscess, however, did not close, although brought under control by the penicillin. It was peripheral and presumably opened into small bronchi—a condition hindering free drainage and the removal of sloughs. During the injections it was evident that the pleura was thick and adherent over the area of lung involved; one might therefore presume a strong outward pull by the chest wall on the cavity walls, counteracting the retractile power of the lung. Further, the location of the abscess near the thickened interlobar fissure would prevent the formation of any compensatory emphysema to neutralise this outward pull on the walls of the cavity (Thomas 1942). It seemed certain therefore that resolution was being prevented by mechanical factors which no amount of penicillin could combat. After consultation the patient was transferred to a hospital for immediate operation.

Aspiration before operation yielded 4 oz. of pus from the chest. Numerous explorations were made on the table with no result Two ribs were removed under general anæsthesia. The pleura was much thickened. The whole of the lower lobe of the right lung was indurated and in a state resembling grey hepatisation. A large irregular abscess was present in the posterior division, into which a drain was placed.

Unfortunately the patient did not recover from the anæsthetic, and the cause of death seemed quite unaccountable until an autopsy was made. This confirmed the operative findings. No pus was present; there was tremendous thickening of the interlobar pleura with organised pus in the space. In addition there was an extensive acute ulcer in the stomach which had perforated into the peritoneal cavity, with escape of stomach contents through the ulcer. The pathologist [illegible] was an antemortem change, [illegible] 7 hours which had elapsed [illegible] tient and the autopsy. In this connexion it is noteworthy that after the sterilisation of the pus by means of penicillin, and the cessation of the hæmoptyses, the slight abdominal symptoms (vague discomfort and some flatulence) disappeared entirely, the weight increased rapidly, the patient looked and felt very much better, and the appetite was enthusiastic. He continually stressed his enjoyment of his food.

COMMENT

We suggest that penicillin should be introduced at the actual site of an infective process, if possible. Such treatment applied earlier in this case might have improved the general, as well as the local, condition sufficiently to encourage operation before it became too late. Even with the late treatment he received, the patient might have recovered but for his astounding and quite unrecognisable gastric lesion. Be this as it may, the successful sterilisation of the accumulation of pus by penicillin, and the advantage of introducing the latter at the site of infection, can hardly be disputed.

We wish to express our appreciation to Dr. J. L. Penistan, EMS pathologist, Bangor, for his interest in this case, and for his numerous investigations.

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FATAL AIR-EMBOLISM DURING BLOOD-TRANSFUSION

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A MAN of 53, with carcinoma of fundus of stomach involving the lower end of œsophagus, was operated on [illegible] on Nov. 14, 1944. [illegible] ion was used, and [illegible] given through a [illegible] spiration. As soon as anæsthesia was obtained, blood-transfusion was begun through the left saphenous vein at the ankle.

Throughout the operation the patient's general state was excellent; the pulse re[illegible] rate of 80 per minute, and [illegible] at 90/70 mm. Hg. After 2 [illegible] which had slowed considerably, was accelerated by raising the pressure in the bottle by means of a Higginson syringe, in accordance with our routine practice. (The original bottle was still in use.) About 15 minutes later,

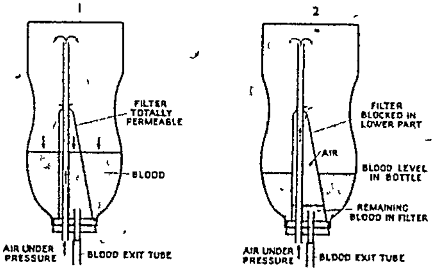

Fig 1—Transfusion with a completely patent filter

Fig 2—Transfusion with lower part of filter made totally impermeable below level of blood

while œsophagojejunostomy [illegible] pulse suddenly became in[illegible] rapidly became cyanosed. [illegible] oxygen was substituted fo[illegible] but without improvement. [illegible] rt, and when the [illegible] was noticed that [illegible] suggesting air-embolism. Cardiac massage and transfusion with a fresh bottle of blood were unavailing.

At autopsy on Nov. 15 the left internal saphenous vein and all the great veins returning blood to the heart were carefully explored. The [illegible] which filled the [illegible] of air bubbles [illegible] cavæ, and the innominate and jugular veins, were dis[illegible] by large and small air bubbles and contained only a litt[illegible] frothy blood The right chambers of the heart and [illegible] monary artery and its branches contained air and froth, not as bright as arterial blood, but much [illegible] the blood usually found in these situations; no air [illegible] in the systemic circulation. After section the [illegible] to minute proportions; they were pale grey [illegible] appeared to contain little if any blood. T[illegible] in the right iliac veins or their main trib[illegible] veins on the left side of the pelvis, and the l[illegible] vein, contained a large quantity. All the [illegible] leg were filled with non aerated blood, as a [illegible] fusion being continued from a new bottle [illegible] collapsed.

EXPERIMENTS

In view of these findings, which [illegible] source of embolism was the blood-transfu[illegible] out some simple experiments. The results are best explained by diagrams.

Fig. 1 shows transfusion with a completely patent filter. Here application of pressure to the air inlet cannot possibly force air through the blood-exit tube. Fig. 2 shows transfusion with lower part of filter made totally impermeable below the level of the blood; to achieve this condition, a filter was painted with collodion solution. If pressure is now applied, it forces any remaining blood within the filter out of the exit tube, followed by air.

In a third experiment we discovered that with a partially blocked filter, a mixture of blood and air can be forced through the exit tube. Since in our case the transfusion never ceased, it seems obvious that this was what happened at the operation. Progressive blockage of the filter by sediment leads to diminution in the supply of blood to the top of the exit tube, and slowing of the drip. If the air pressure in the bottle is increased at this stage, the passage of blood through the filter is not increased: rather, air passes into the filter cone, and the exit tube delivers air and blood intermittently. Thus, unless the drip-chamber is carefully watched, it may be supposed that the pressure is still inadequate, and it may be increased. Closer inspection would reveal the intermittent columns of air entering the drip-chamber.

DISCUSSION

Keith Simpson (1942) has described 4 cases of air embolism due to attempted transfusions; the only relevant one is his first, in which the level of saline in a reservoir not provided with a wick filter fell below the exit tube, and massive air-embolism developed while hand-pump pressure was being used to maintain the infusion. Devas (1942) points out that a hole in the delivery tube or leaking side-inlet into a Laurie drip-chamber can easily produce air-embolism. None of the findings described by these investigations, however, are pertinent in our case.

Though we have found no record of an accident like ours, it can hardly be the first example. But unless air-embolism is suspected, post-mortem examination may not reveal its presence. The bubbles of air in the veins may not be noticed, and once the veins or organs are opened air may be sucked in, and the diagnosis missed. According to Keith Simpson, if the veins leading from the suspected site of entry are exposed but not opened, they will show a string of air bubbles. These were not present in our case, for the reasons given above. By filling the pericardial sac or anterior mediastinum with water before opening, the heart it is possible to demonstrate conclusively the contained air.

The minimal lethal quantity of air is unknown, and very varying estimates are given (Richardson 1937). Massive embolism fills the vascular bed of the lungs and causes rapid death from anoxia; smaller volumes, more slowly introduced, cause death by passage of the emboli through the lung capillaries into the cerebral and coronary vessels. Keith Simpson estimates that 10–15 c.cm. of air is fatal in a patient whose resources are already severely taxed by hæmorrhage, operation, or illness.

SUMMARY AND CONCLUSIONS

Air-embolism was produced by raising the pressure in a blood-transfusion bottle when the filter was partly blocked.

Probably some deaths attributed to shock of operation or status lymphaticus are actually due to air-embolism, which goes unrecognised because routine methods of post-mortem examination do not reveal it.

The method of forcing transfusion with a Higginson syringe is dangerous unless constant close supervision is exercised.

Our thanks are due to Mr. N. R. Barrett for permission to publish the case-record.

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Reviews of Books

Large Scale Rorschach Techniques

M. R. HARROWER-ERICKSON, PH D, research associate, department of neuropsychiatry, University of Wisconsin; M. E. STEINER, MA, personnel section, General Electric Co., Bridgeport. (Baillière. Pp. 419. 47*s.*)

THE methods described in this book represent the first definite advance in Rorschach testing since the original appearance of the ink-blot interpretation technique. Two main obstacles have hitherto prevented the large-scale employment of the Rorschach method. The procedure is extremely lengthy, and has to be carried out by a specially trained person; and it is highly subjective, and not adapted to statistical analysis and treatment. Dr. Harrower-Erickson has developed two methods which overcome these difficulties in varying degree—the group Rorschach and the multiple-choice tests. The group Rorschach, as its name implies, can be given to a number of subjects simultaneously and the testers need no Rorschach training. Interpretation of results still requires a skilled Rorschach worker, though much time can be saved by using Monroe's methods. Types of response obtained have been thoroughly analysed. In the multiple-choice test the subject is required to choose from a limited number of responses the one which, for him, most closely resembles the ink-blot. This choice can be scored quite objectively, and can be interpreted by persons with no special Rorschach training. Data are presented to show how far the procedure succeeds in separating neurotics and psychotics from normal subjects. An adapted form of the multiple-choice test has given promising results in this country.

The statistical evaluation of the material leaves something to be desired. Thus, large numbers of frequency diagrams, giving percentage occurrence of various Rorschach signs, are presented without an attempt being made to establish the statistical significance of differences between contrasted groups. But the fact that such criticisms can be made shows how far the authors have succeeded in transforming an entirely subjective test into an objective psychometric tool.

Lectures on Preventive Medicine

HARVEY SUTTON, OBE, MD, DPH, lieut.-colonel AAMC, professor of preventive medicine and director of the School of Public Health and Tropical Medicine, University of Sydney. (Consolidated Press. Pp. 658. 27*s.* 6*d.*)

Colonel Sutton's course of lectures are written, as delivered, in a racy style, with the manner of vigorous youth. Sometimes his summary seems too abrupt, but it is intended for the student's notebook rather than the general reader. The little errors that have crept in are not a serious blemish upon a fresh and interesting work, and the statistical tables scattered through the pages do not interrupt the reader's train of thought, because they are really part of the story. Many of the figures are drawn from recent Australian sources. The 1940 maternal mortality figures confirm the finding of Mrs. Burns, in the Durham area, that the first birth is the safest, and that there is a fairly steep rise in mortality after the sixth child. The statistics also show that the *young* primipara has by far the greatest chance of safe childbearing, and that the multipara over 35 needs the closest attention from the obstetrician. Colonel Sutton believes that the main reason is a depreciation in vigour and vitality in women after 30.

The British Journal Photographic Almanac, 1945

Editor: ARTHUR J. DALLADAY, A INST P. (Greenwood. Pp. 388 + 32. 3*s.* 6*d.*).

THIS octogenarian annual is as hearty as ever though 6 years of war have robbed it of its foreign references. The introductory article reviews the growth of photography for the last 30 years and shows how the scientific worker has come to demand more accurate apparatus and more precise results. Technicians of high quality are likely to be needed, and photographic education must soon offer recognised qualifications and diplomas. Practical articles and tables, formulæ, and processes make up the book, and redundant material has been carefully pruned away.

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Brit. J. Surg., 1941, 29, 168.

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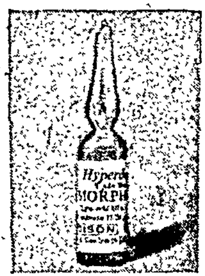

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THE LANCET

LONDON: SATURDAY, APRIL 28, 1945

Time for Decision

NEGOTIATIONS about medical work after the war have reached a crucial stage. Next week the British Medical Association at a special representative meeting, and other bodies, will consider a report from the Negotiating Committee which embodies a tentative scheme of organisation If the verdict on this scheme is favourable, the Minister of Health will discuss it with his colleagues in the Government; and if the Government approve it a Bill may be presented to Parliament in May or June. Although the negotiators' report is formally regarded as confidential, and therefore cannot be published, copies have been sent to all members of the profession. It has raised again two familiar questions: What is the need for change? Why the hurry?

At present there are thousands of medical services in this country at one end of the scale is the small one-man practice, and at the other end is the vast Emergency Medical Service, and intermediately there are partnerships, public medical services, autonomous hospitals, and municipal institutions. Everyone agrees that in some places these services overlap, while in others they do not touch; and hardly anyone is satisfied that existing resources are being used economically, so that every patient gets the best they could offer him The cost of hospital treatment has already risen so far that a great many people—especially middle-class women who are not accustomed to ask for charity—are deterred from seeking advice, for they know that one or two serious illnesses may financially break their homes. National health insurance and hospital contributory schemes have done much to make medical help accessible to those who could not otherwise afford it; but NHI provides only general-practitioner service, and only for workers, while contributory schemes, unless the contribution is high, cannot cover all vicissitudes The Government think it so important that comprehensive medical care should be available to all who need it—regardless of capacity to pay—that they propose a universal service which will entitle everyone to any medical attention which he requires and which is obtainable. This proposal can be realised only if the thousands of existing medical services pool their resources in the single national service. But such pooling does not necessarily mean that their individuality will disappear. The white-paper recognised the desirability of preserving the independence of the voluntary hospitals, the necessity of preserving the individual doctor-patient relationship, and the importance of combining democratic control of the new scheme with full opportunity for expert advice and the expression of professional opinion. All the modifications that are now suggested aim at attaining these objects more effectively by securing freedom of action for participants in the service while increasing their influence on its administration. So far from being a preliminary to the disciplined "State medical service" which most doctors would disapprove, the kind of organisation now proposed is in our view an alternative to it. Its eventual form will depend on the structure of British society in years to come; but its successful establishment now would postpone indefinitely the danger of a "State medical service" on authoritarian lines being inflicted on an unwilling profession.

Why the hurry? Some of the politically-minded are anxious to postpone decisions because they think the General Election will produce a Government lukewarm about social security and content to do no more than extend National Health Insurance to the dependants of those at present insured. Others are equally against speed because they expect to see next autumn a Parliament eager for full socialisation of the medical profession. Neither of these eventualities appeals to us; and obviously there would be big advantages in reaching an agreed solution before the election, so that these complex issues will not be decided on party lines. But there are other reasons against unnecessary delay. The end of the war, in the East as well as the West, may not be very far distant, and as soon as men and women return from the war there will be a pressing need to show them that they are coming back to something potentially better than they left. A social security scheme embracing every single citizen on equal terms would help to carry into peace the sense of unity engendered by war; and even those who do not see it as a fitting memorial to the service of all sorts and conditions of men must admit that it would be a stabilising influence in the perilous years ahead. A social security scheme covering everyone implies a medical service covering everyone: for any Government that agrees to pay substantial allowances during illness must make sure that all the persons covered can get medical attention whenever they need it. No doubt good houses and good food and good working conditions are what is chiefly required to make the population fit; but doctors can nevertheless do much to help people to keep well, or, when they are ill, to restore their health expeditiously. The past few years have produced so many effective remedies that the practitioner can do far more than before, and medical practice is of greater importance to the community than it has ever been.

These arguments will not of course appeal to anyone who disapproves of increasing social security. But there are at least four other reasons for reaching early decisions on post-war medical organisation. The first is that action of some kind will be needed almost at once to rescue the voluntary hospitals, most of which will find themselves in trouble as soon as EMS grants are withdrawn at the end of the "emergency." Secondly something must surely be done to continue the valuable specialist services which the EMS has brought to many areas which never previously enjoyed anything of the kind. Thirdly it seems highly advisable, if not essential, that by the time thousands of young men return to this country to take up civil practice—many of them for the first time—they should know precisely what prospects are open to them. If for example they have to buy their way into practices in the traditional way, they should be able to do so in confidence that the whole system of practice is not going to be changed within a few years. Fourthly there is, and long will be, a shortage of doctors. This does not mean, as some suppose, that everything should be left as it is until, twenty-years hence, the shortage is overcome. It means, on the contrary, that a new service should be brought into being as soon as possible. The right answer to scarcity is intelligent and efficient use of whatever is scarce. Doctors will be precious in post-war Britain, and arrangements must be made enabling them to do their work to the fullest advantage.

One of the ways in which a practitioner's output can be raised is to relieve him of tasks that can be equally well performed by non-medical staff, and we have always regarded the rapid development of health centres as a rational means of meeting the situation that lies ahead. If the present scheme seems to lay emphasis on the experimental nature of the proposals for health centres, that after all is not a departure from the white-paper, which recognised that an advance of this kind must in its early stages be an experiment. What actually happens will depend less on decisions next week than on the keenness of those who make the experiments, and on the interest shown in them by doctors and the public. Compared with those of the white-paper, the arrangements now contemplated give less promise of early improvement of conditions—either for patient or doctor—in backward municipal hospitals; and some may feel that the privileged position accorded to voluntary hospitals will delay reforms that many of them urgently need. But these various concessions to the representatives of the three bodies chiefly concerned—the profession, the local authorities, and the voluntary hospitals—are none of them fatal to the main conception of a comprehensive medical service for everybody, improving in quality as fast as is feasible. The object has been to secure rationalisation without regimentation, and the many years of discussion both inside and outside the profession, followed by long and patient negotiation, have brought forth a scheme which is workable because it is (or should be) acceptable to those who will have to work it. How far it succeeds in its great purpose will rest largely with our own profession, which will be able to make its voice heard as never before.

Artificial Pneumoperitoneum

IN the treatment of pulmonary tuberculosis the aim of all ancillary measures must be not only to bring rest to the affected part but to reduce tension in its neighbourhood so that it may relax into the position best suited to its healing. These two desiderata, although intimately related, are in fact quite distinct and are rarely achieved simultaneously. A successful thoracoplasty may both immobilise a diseased region and bring the walls of any cavity therein into benign apposition, so reducing their sputum-forming capacity even though they may never cicatrise together. A "perfect" artificial pneumothorax may bring about the same situation by allowing a diseased lobe to retract and achieve reasonable immobility while the hyperextensible healthy lobe is literally given enough breathing-space to perform the respiratory function for both. But a less perfect APT may achieve only one or neither of these effects—in fact, it may do the reverse and increase local tension and/or movement. When, for instance, disease is scattered throughout a hemithorax, an APT, even if adhesion-free, will increase the extensile movement by virtue of the very fact that all the lobes are partially collapsed; for the smaller a balloon the greater the variation a breath of air will make in its diameter and circumference. In this event the whole lung-tissue will then be submitted to increased concertina-movement, unless the elasticity and extensibility of the healthy lung substance are sufficient to permit "internal selective" relaxation and immobilisation of the diseased areas. Another imperfect APT may increase the internal tension of a cavity by perpetuating a one-way-valve effect in its tributary bronchus. Occasionally an imperfect APT may be improved by cauterisation of adhesions; but adhesions are not always divisible, and section of the larger vessel containing adhesions always entails the obliteration of a collateral blood-supply (which has presumably developed for a good therapeutic reason), the abolition of which often leads to local necrosis, sloughing, an bronchopleural fistula.

In cases where thoracoplasty (an irreversible operation) is regarded as too drastic, and where an APT has proved ineffective, other measures may have to be tried; and commonly the next step is phrenic interruption. Paralysis of a hemidiaphragm is said to cut down the vital capacity and the extensile lung movement on that side by more than 50%. In addition the rise of the diaphragm allows the lung as a whole to contract, thus giving the diseased areas their chance of internal selective relaxation. Which regions of the lung benefit from these alterations in tension depends on the amount and distribution of pleural symphysis, and this cannot be foretold with any great accuracy, though the radiological appearances after the preliminary "unsuccessful APT" or in WYNNE-EDWARDS's "cough test" may suggest freedom and retractility of one or other zone. As might be expected, disease of the lower zone usually derives most benefit from diaphragmatic paralysis, but it is by no means uncommon for subapical disease, even with excavation, to resolve and heal. Temporary paralysis by means of a "phrenic crush" i beneficial sufficiently often to warrant its trial.

Evidence has lately been produced that the effect of phrenic paralysis can be greatly enhanced by artificial pneumoperitoneum. CLIFFORD-JONES and MACDONALD[1] found in ten cases that the average rise of the diaphragmatic dome brought about by phrenic crush alone was 2·8 cm.; when reinforced by APP the average rise was 7·8 cm. In a series of nine measured cases, EDWARDS and LOGAN[2] found that after APP the rise *increased* by an average of 6·5 cm.; in one case the dome achieved a total rise of 14·5 cm. They also noted clinical improvement in 20 out of 5 cases subjected to this treatment. Artificial pneum peritoneum therefore seems to have a definite pla in the relaxation-and-immobilisation therapy of pulmonary tuberculosis, although indications and contra-indications have not yet been fully established. RILANCE and WARRING,[3] in their 55 cases of APP with phrenic crush, noted that the best results were obtaine in lower-zone cavities, next best in upper-zone cavities and worst in mid-zone cavities. CLIFFORD-JON and MACDONALD agree with these findings. It seems generally accepted that nothing can beat the "perfect" APT, but that the APT which remains ineffective even after pneumolysis should be abandon

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1. Clifford-Jones, E., Macdonald, N. *Tubercle*, 1943, 24, 97.
2. Edwards, P. W., Logan, J. *Ibid*, 1945, 26, 11.
3. Rilance, A. B., Warring, F. C. *Amer. Rev. Tuberc.* 1941, 44, 3

early, and phrenic crush with APP given its chance. A case can also be made out for APP immediately after parturition in tuberculous women, as advocated by **Barnes**,[4] to prevent the disastrous effects of the sudden descent of the diaphragm and maintain any improvement which accrued from its elevation by the pregnant uterus.

A further use has been described by **Belbenoit**[5] in a case where APP relieved severe abdominal discomfort and vomiting, whose onset had been determined by left phrenic interruption but whose origin was proved by subsequent laparoscopy to be attributable to plastic peritonitis with adhesions in the neighbourhood of the cæcum.

Is pneumoperitoneum fool-proof? Apparently not. Until recently most writers have emphasised the ease and safety of its performance, and have almost lightheartedly reported the complications and accidents they have encountered. Shoulder-tip pain, intraperitoneal effusions, puncture of various viscera, anorexia, and posterior mediastinal emphysema all seem harmless and transient, although maybe worrying both to operator and patient at the time. But **Warring** and **Thomas**[6] recorded a sobering case of following a bout of vomiting four days , and now **Aslett** and **Jarman**[7] report expected deaths in a series of 30 cases. These two fatalities may also have been due to seeping air embolism, but the suggestion that the symptoms were due to cardiac embarrassment fits in better with the description of malignant pneumomediastinum given by **Macklin** and **Macklin**.[8] There air is forced through the diaphragmatic hiatus, causing an ever-increasing intramediastinal pressure because for some reason the usual escape routes into the neck and retroperitoneum are not opened up. In the maintenance of artificial pneumothorax—as indeed in all operative procedures—it is proverbial that even the most experienced operators will eventually hit a snag, and it is equally notorious that disasters rarely come singly. We must therefore commiserate with **Aslett** and **Jarman** on their bad luck, be grateful for their frank cautionary tale, and vainly wish with them that autopsy could have been performed to lay bare the pathology.

Treatment of Germany

THE settlement of Europe centres round the Germany Partly it is a material tion, with famine in the offing. psychological problem. We must l definite defeat will be ultimately salutary to this particular nation, but we can only guess how best to turn it to advantage. The latest and fullest reports of Nazi concentration camps, which can no longer be dismissed by anyone as incredible, show how far the rulers of the Third Reich and many of their subordinates have departed from ordinary standards. These people, the man-in-the-street says, must be virtually mad; and they have created an abnormal state of mind in all Germany. What treatment, he asks, would the psychiatrist recommend?

The psychiatrist has no simple answer. Confronted with an individual psychopath, and given enough time, he can hope to uncover the sources of abnormal behaviour and perhaps bring back mental health or at least improve the behaviour of his patient. But to apply his new science to a group of 80 million people is more difficult. The layman, who likes to use medical metaphors when talking of political events, has not been slow to describe National Socialism as a "mass psychosis." But this is scarcely more than a figure of speech. **Hecker** in a famous book has collected the psychic epidemics of past times, and his monograph is a melancholy reminder that human beings in every age have demonstrated that they do not act rationally. Anthropologists, using the more recent data of medical psychology, have not yet established principles about the behaviour disorders of groups, but they have made a sound beginning. **Rivers** of Cambridge was early in pointing the way; and he was followed by such workers as **Malinowski**, **Benedict**, **Mead**, and **Sapir**, who studied social heritage, including traditional methods of child-rearing, parental attitudes to various "good" and "bad", behaviours, interpersonal relations, and other group characteristics which impart distinctive cultural patterns to societies and their institutions. From the study of the unconscious mechanisms of psychological disorder it was natural to proceed to the analysis of normal and abnormal behaviour in individuals of alien cultures or earlier times and thence to the examination of self-contained primitive groups, such as island tribes of the Pacific. Meanwhile sociologists were surveying civilised group-life in industry, town communities, and the like. These social studies have provided both working concepts and rough standards against which individual and collective behaviour can be assessed.

The symptoms of disease in Germany's body politic are well known: internal conflict during the brief tragic Weimar Republic; an outburst of collective self-assertion with denial of military defeat; creation of scapegoats in the form of Jews, Freemasons, and Bolsheviks; widespread individual surrender to a group-leader who is enfolded in an omnipotence myth; loss of normal relations between members of the same family and between neighbours; the deliberate cultivation and acceptance of hatred; and finally murderous attacks on the environment. These are malignant and ominous from any point of view. True, all bodies politic show symptoms of unhealthiness, or what might be interpreted as such; but they have seldom if ever been so gross and immediately horrifying as those seen in Germany against the background of contemporary and traditional European civilisation. A capacity for cruelty is latent in all mankind; but in civilised communities it is strongly checked by education, leading to a healthy public opinion, and also, to a much smaller extent, by legal penalties. German youth, however, have been taught devotion to the "father figure," typified in a leader who has not merely condoned but encouraged cruelty; and their sense of guilt for violence and savagery carried out by the group, and sanctioned by the leader, is less than the guilt of an individual for his share in group violence or for any independent violence in which he may engage.

There is now an opportunity for close study of the German social picture, and for systematic field work which will add to our knowledge of group behaviour; and as a long-term policy for European peace it is very necessary that full use should be made of this opportunity. The urgent problem of treatment and prophylaxis is not one to which the anthropologists, psychiatrists, and sociologists have a ready answer, though they know something of its ætiology. The combined efforts of social scientists should, however, contribute usefully to such a task if their help were enlisted. We have seen a generation defrauded of their social heritage, stripped back to the savage, and giving the savage virtues a prominence long since denied them in adult society. They have been reduced to juvenile levels of behaviour; and, like children, must regain an understanding of justice and humanity by seeing them in action.

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[4] Barnes, J. *Lancet*, 1939, ii, 878.

[5] [illegible]

Annotations

NEW FELLOWSHIPS IN MEDICINE

THE preventive side of medicine is yearly gaining a greater share of attention. The trustees of the Nuffield Foundation, recognising that more trained research-workers and teachers are needed in this branch of medicine have made a timely offer of a limited number of postgraduate fellowships for fitting men and women to fill senior teaching and research posts in social medicine, child health, industrial health, and psychiatry. The value of the fellowships will normally be £500–800, with the addition of travelling expenses to fellows who go abroad for study. The award will be made for one or more years, but will not usually be tenable for more than three. Candidates must normally live in the United Kingdom, and hold a university degree in medicine registrable there. Their merits, abilities, and inclinations must fit them for an academic career in one of the branches for which the fellowships are offered, and they must have had some general clinical experience since registration, usually as resident officers in general medicine and surgery. Service with the Forces will be taken into account. The programme of training of successful candidates, and the institutions at which it is carried out, will be approved by the trustees, and usually will include study abroad during the last fellowship year. For a part of the time fellows will be relieved of clinical duties and encouraged to study pathology and "the sciences fundamental, or allied, to clinical science." At the end of each year the fellow will send in a report of his work to the trustees, who reserve the right to terminate the fellowship if they feel he has neglected his obligations.

Applications for these medical fellowships may be made at once. Candidates must be recommended by the executive authority of a university medical school, and doctors serving with the Forces may apply at once for fellowships tenable on their demobilisation. Forms of application may be had from the secretary of the Nuffield Foundation, 12, Mecklenburgh Square, London, WC1.

AIR EVACUATION OF CHEST CASES

THE transport of sick and wounded by air has some special problems where chest cases are concerned. Blood or air enclosed in the pleural cavity exerts a relatively greater pressure as the barometric pressure falls with altitude. In pre-war days the importance of this factor was already recognised in patients with artificial pneumothoraces, who were advised to travel below 6000 ft. and never above 8000 ft. for fear that they would develop dyspnœa from excessive internal tension and that adhesions might be ruptured.[1] Similarly large refills should not be given preparatory to air travel, but the refill becomes increasingly necessary after landing. The extensive use of air transport in the South Pacific[2] has proved it of the greatest value in removing wounded rapidly over long distances. The patient requires little handling and travels more smoothly than in most other forms of transport. Heights up to 3000 feet do not worry passengers and over vast stretches of water flying at 500 feet is usually possible. Nevertheless, when chest cases are to be taken on a long voyage by air oxygen should be carried, and it is advisable to have an aspirating needle handy, with some form of non-return valve, for insertion into the pleural cavity if the need arises. A sudden increase in intrathoracic pressure can be alarming to the patient, who may easily make matters worse by panicking. As Blair[3] has pointed out, men with chest wounds should lie injured side down, so that the mediastinum falls away from the normal side and does not compress healthy ventilating tissue.

The future of air ambulance services is assured, but the pressure effects encountered at high altitude must influence the selection of cases with wounds of the air-containing viscera unless the patient's condition is stabilised or a safe flying level can be guaranteed.

DEATHS FROM MEASLES

IN studying the annual reports of medical officers of health for 1940 Lieut.-Colonel William Butler was impressed by the small number of deaths from measles considering the number of cases notified. Not more than a tithe of the deaths which his long experience would have led him to expect were being reported. His interest thus aroused he made a wider survey of the past and present situation and communicated the results to the Royal Statistical Society on March 21. Whooping cough, he said, showed no such deviation from past experience. Of cases notified in 1940–42, between 12 and 13 per 1000 were fatal, whereas with measles only some 2 per 1000 died. There is no reason to believe that measles is any less prevalent than it was. Has it changed its character or can we reasonably attribute its present low fatality-rate to improved care and treatment or to a higher age of attack? Postponement to later childhood would certainly have a pronounced effect since the risk of dying from measles declines steeply with age. Butler believes that this is an important factor in the improvement but not the whole story, for it seems likely that at each age-period the risk of death has materially declined. Better treatment would partly account for this, but there is a general impression among clinicians that they are dealing with a less severe disease. Districts with 1500 to 2000 cases commonly report not a single death, and children at the ages of high risk cannot have completely escaped attack in such epidemics. The change to the lower fatality appears, too, to have been somewhat abrupt. The congregation of infants in wartime nurseries and nursery schools has often led to better care of children by trained personnel and higher standards of cleanliness and environment compared with a slum or poor home, but there were fears that the unavoidable herding together of children at the ages of high mortality would offset their advantages. The results so far have apparently not been serious, and as regards measles Butler believes that this is because of the mild character of the war epidemics.

PÆDIATRIC PLANNING IN WOLVERHAMPTON

THE Royal Hospital, Wolverhampton, has appointed a committee to draw up a scheme for its post-war development and at its first meeting it decided that the hospital should have a special department of pædiatrics under the leadership of a pædiatrician who would be a new addition to the honorary staff. The committee approached the British Pædiatric Association for expert advice and in March the president of the BPA. Prof. L. G. Parsons, led a delegation of seven to Wolverhampton. Before this, documentary material, plan and statistics had been circulated to the pædiatri so that they went armed with some knowledge of the local conditions, both as regards Wolverhampton and the Royal Hospital, and [illegible] development. The proceed[illegible]ll dinner party at which men[illegible]ing committee, medical and lay, met the pædiatricians and took part in a general informal discussion. The next day opened with a visit to the Women's Hospital, where the arrangements for the newborn were inspected and the site was considered in the light of possible extensions. Next came "Penn," outside the city, where inpatient children's beds of the Royal Hospital have been housed as a war-time measure, and during the afternoon the pædiatricians inspected the existing facilities for outpatients and inpatients in the main building of the Royal Hospital. Over a cup of tea they gave their preliminary conclusions, which were later incorporated in a written report, approved by the executive committee of the BPA, [illegible] to the authorities at the Royal Hospital. [illegible] this report and the plans of the Wolver[illegible]ittee are, of course, confidential at this stage, but from both sides the experiment appears to have been a success. The medical officer of health was present at some of the discussions to advise on vital statistics and likely developments in the local authority's sphere. The hospital committee not only maintained a standard of entertainment which the pædiatricians are said to have found somewhat overwhelming but also organised the whole visit excellently, even to the provision of a shorthand-typist to take down the visitors' obiter dicta. This is probably the first time that a large hospital has sought the advice of outside medical experts in a special branch of its work and Wolverhampton's ad might with advantage be followed elsewhere and in epartments other than pædiatrics.

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[1] Todd, G. S., Anderson, D. M. *Lancet*, 1943, ii, 597.
[2] Goldman, A. *Nav. med. Bull., Wash.* 1944, 43, 685.
[3] Blair, L. G. *Proc. R. Soc. Med.* 1941, 35, 97.

THIOURACIL TOXICITY

THE latest report concerning the toxicity of thiouracil omes from Harrogate, where Curtis Bain[1] has encounered a patient in whom thiouracil caused complete eart-block and pericarditis. Of the diagnosis there can e no doubt; the electrocardiograms are unequivocal, nd pericardial friction was audible for at least ten days. hiouracil, in doses of 0·2 gramme five times a day, had een given for a fortnight when the patient suddenly omplained of a sharp pain in the chest; when an lectrocardiogram was taken she was found to have omplete heart-block. While the patient was known have tonsillar sepsis before treatment was initiated, he had never complained of a sore throat and there was ever any suggestion of acute tonsillitis. The fever ccompanying the attack subsided on the day that hiouracil was stopped. Eight months later the woman as back at work and there was no evidence of a valvular esion of her heart. It seems certain that thiouracil recipitated the cardiac disturbance; to what extent the onsillar sepsis was a contributory factor is problematical.

THE EEG ELECTRODE

IN electroencephalography the design of the electrodes s more important than in electrocardiography. A low nter-electrode resistance is essential; so attention has een paid both to the method of attachment and to the onstruction of the electrode. An entirely satisfactory lectrode has not yet appeared. According to the Gibbs,[2] he ideal device should not produce artefacts, but should e "easy to apply, easy to keep on, easy to get off, cheap nd painless." In this country saline pad electrodes, ressed to the scalp by rubber bands, have been widely sed.[3] Such electrodes can be easily and rapidly applied, nd for routine work have proved satisfactory, but for he restless or nervous patient or one with a scalp wound the method is not ideal. Further, the saline pad tends to dry after a long period of recording, and the electrodes shift with movements of the jaw when they are held by a cap secured beneath the chin. This is particularly the case during hyperventilation. In America some of these disadvantages have been overcome by using small solder pellets, attached to fine wires and fixed to the scalp with collodion. But the technique requires much practice and the time taken for preparing the patient is more than doubled. Greville and St. John-Loe[4] have now developed a technique which has some of the advantages of both methods; the electrodes are easily and rapidly applied, no cap is required, and the attachment to the scalp is relatively firm. A small silver cup containing electrode paste or jelly is held to the scalp and covered with collodion from a syringe having a nozzle attachment which is of slightly greater diameter than that of the cup over which it fits. The input lead is subsequently attached by clipping it to a light ring attached on the electrode, thus allowing the electrode time to become firmly stuck to the scalp before the drag of the wire is placed on it. The designers claim that the resistance is usually lower than that of saline pads and that twelve electrodes can be applied in less than ten minutes—a favourable comparison with the American technique.

TYPHUS IN GERMANY

As the liberating Allied Armies push even deeper into Germany, some of the crimes committed by the Nazis and condoned by their government are being revealed. Apart from their other aspects, the concentration camps are of epidemiological importance, since typhus and other infections have been found in many of those already over-run. The discovery confirms only too well the trickle of epidemiological information from Germany which has been forthcoming in the past three years. The policy of the Nazis toward the population of the eastern European countries has transferred the typhus which has been epidemic for years in these areas to the virgin soil of the west. From the scanty information so far available, it seems that the Nazis have largely confined the typhus within the walls of their infamous prisons, though in the latter every condition favouring spread of typhus, except clothing, has been encouraged. The story of Belsen camp recorded in the *Times* of April 14 and 19 suggests the existence at present of at least 1000 cases of typhus among the 40,000 inmates, as well as many thousands of cases of tuberculosis and typhoid, and similar reports come from elsewhere. The effort needed to control this infection and to prevent its spread throughout the milling population of the broken State can well be imagined. Here is a situation which is going to test to the full our newly-won powers over one of the historical enemies of mankind. If the outcome in Naples last year had not been so strikingly successful, we might consider the situation to be extremely menacing. As it is, with Naples behind us, we can at least feel hopeful of the outcome of the struggle, though the immensity of the problem should not be minimised.

In the first place, we are nearing the month of May and therefore the close of the typhus season. Lousiness always decreases as climatic temperature rises and though other factors may tend to increase dissemination of lice, time is clearly on our side. Then too, Naples taught us it was unnecessary to eradicate all the lice in the population in order to control the typhus. The rickettsial-laden lice which constitute the menace are concentrated on the bodies of the actual patients and their contacts, and on convalescents. Search for actual cases and saturation of their environs with a persistent insecticide such as DDT are the two key measures to be taken. The presence of many medical officers in the

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[1] Bain, C. W. C. *Brit. Heart J.* 1945, 7, 49.

[2] Gibbs, F. A., Gibbs, E. L. Atlas of Electroencephalography, Boston Mass. 1941.

[3] Walter, W. Grey, *J. Neurol. Psychiat.* 1938, 1, 359.

[4] Greville, G. D., St. John-Loe, P. *Electronic Engineering*, February, 1945, p. 377.

Allied Armies with experience of typhus from their sojourn in the Middle East, in Africa, or in Italy will be helpful in the discovery of cases. The supply position with regard to DDT is also likely to be easier now than it was a year ago, though the method of application of DDT as a dusting-powder will probably remain the same. So far as our armies themselves are concerned, the experience already gained in the war has indicated the high degree of protection afforded by immunisation together with louse control, and we may therefore expect the soldiers to remain unscathed.

Less satisfactory outcomes are likely in the case of the patients in the camps. Typhus combined with tuberculosis and typhoid will undoubtedly exact an appalling mortality. The terrible conditions of privation which have been enforced will undoubtedly add to the difficulty of deciding the exact cause of illness or death in many instances. Such advances in the treatment of typhus as have been recently claimed have already been mentioned in these columns. Good diet and nursing care remain the most important weapons in the hands of those of our colleagues in whose care the patients will be placed. The problem of looking after such large numbers of patients will be enormous, and a full share of the task should be borne by those who have allowed the situation to develop.

HÆMOGLOBIN IN PLANTS

HÆMOGLOBIN, the red pigment characteristic of vertebrate blood, consisting of a protein, globin, combined with the iron-containing porphyrin derivative, hæmatin, occurs sporadically among the invertebrates, sometimes in unexpected parts of their body. In a few species its place as an oxygen carrier in the circulating medium is taken by a copper-protein compound and possibly in others by a vanadium derivative. These pigments differ structurally from hæmoglobin in that they do not contain the prosthetic hæm grouping, and may be regarded as pilot developments which Nature has never accepted for production on a large scale. They may be compared with the experiments in mineral metabolism which Nature has carried out with cadmium,[1] and with silica and iron.[2] In hæmoglobin, both oxy- and reduced, the iron is always present in the ferrous form. Of much wider distribution are the hæmatin-iron compounds which have been adopted by all aerobic plants and animals as intracellular respiratory catalysts. These compounds, although structurally resembling the prosthetic grouping of hæmoglobin, work in an essentially different way, for in them the iron changes reversibly in valency as the hydrogen is passed from the cellular donators to molecular oxygen.

A new chapter has now been added to this story by the discovery that a red pigment of hæmoglobin type can be recovered from the root nodules of leguminous plants.[3] It forms with oxygen a loose compound in which the iron remains in the divalent state and which reacts like hæmoglobin with carbon monoxide and ferricyanide. The function of this compound is not yet known, but it is thought to be connected with nitrogen fixation by the nodules, because it seems constantly to be present in them, and nitrogen fixation can be prevented by a concentration of carbon monoxide so low that only a hæmoglobin derivative would be likely to react with it. Neither the plant cells alone nor the nitrogen-fixing bacteria alone can produce the compound —it is a true product of the symbiosis—and this suggests that only by some cell-bacterial interplay can the highly specific globin be produced in the plant kingdom, for it is the synthesis of this globin which limits the distribution of hæmoglobin throughout Nature.

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1. Fox, H. M., Ramage, H. *Proc. roy. Soc.* B, 1931, **108**, 157.
2. Jones, E. J., McCance, R. A., Shackleton, L. R. B. *J. exp. Biol.* 1935, **12**, 59.
3. Keilin, D., Wang, Y. L. *Nature, Lond.* 1945, **155**, 227.

Reconstruction

A CENTRAL MEDICAL BOARD?

THOSE who have received and studied the Negotiating Committee's report on its discussions with the Minister of Health will find themselves thinking again about the many instruments of administration apparently required for the provision of a comprehensive national medical service. Everyone wants to see its administration made and kept simple and human. Nevertheless in seeking to avoid complications we must also avoid authoritarianism. So, while the profession will not wish to see committees or officers added unless they are clearly needed, it will be well advised not to reject without thought any part of the proposed structure that may contain elements conducive to the just and democratic conduct of the service.

When first published, the administrative provisions of the white-paper must have presented to many the picture of a jigsaw puzzle. And perhaps the piece that looked least likely to fit into its fellows was that labelled the Central Medical Board. This extra piece appeared in fact a thing apart, for whose presence there seemed to be only two [illegible] reasons: (1) to make easier the ce[illegible] the distribution of doctors; and (2) to provide a central employing authority for the general practitioner, which would give him the clinical independence which he felt would be jeopardised if he became the direct employee of his own local authority. It was chiefly against the first of these functions (secured by making doctors ask the Board's permission before undertaking public practice in any particular locality) that dissentient voices were raised. In objection to these so-called powers of direction it was claimed that methods of attraction could as effectively, and much more fairly, be used to meet the needs of under-doctored areas. If, in framing a new Bill, the Government do not demand that doctors should ask permission before entering practice anywhere, or in any way, the objections raised to this Board will mostly disappear. But, shorn of these powers, would it then be any more than a vestigial remnant not worth preserving?

TASKS FOR THE BOARD

What functions would remain? First, those anticipated by the white-paper, where it was suggested that the Board should not only be the contracting body to whom each doctor in general practice would be responsible, but also the body determining what number of public patients doctors in different areas, and with different commitments, might reasonably be expected to care for. The white-paper also spoke (rather less specifically) of other functions, and suggested that the Board might be able to facilitate the movement of doctors within the service, to arrange for the employment of assistants both in health centres and in separate practice, and to see that these assistants have proper contracts and conditions of work. It suggested also that the Board might arrange postgraduate instruction and refresher courses for practitioners, and generally watch over the well-being of doctors in the service.

Subsequent discussion (and the replies to the British Medical Association's questionary) showed that the medical profession was not averse to the conception of such a Board, provided always that it did not have "powers of direction," and showed also that some doctors favoured the inclusion of consultant as well as the general-practitioner service within the Board's orbit. There is certainly a case to be made—almost as strong as that for the general practitioner—for the central employment of the consultant and specialist. True, those consultants and specialists who, in the new service, would be working exclusively at large voluntary hospitals —especially teaching hospitals—would probably find it more convenient and quite satisfactory to be directly employed by their own hospital. But if they were employed in a local-authority hospital, or—as may easily happen in the future—at a group of hospitals some of which were voluntary and some municipal, they might well prefer a central single employing body far removed from all influence of local politics. Such a body could well be the Central Medical Board, particularly if its constitution were modified to allow of the representation of consultants among its members.

Of late, however, the pendulum has swung, and now arguments are [illegible] tions we have so far [illegible] more safely be entr[illegible] the purlieus of Whitehall. Even the employment of the general practitioner, it is said, could be left in the hands of whatever committees succeed the present insurance committees. Such committees were referred to in the [illegible] as local committees of the Central Medical [illegible] whatever the final central structure, it is [illegible] it much of the day-to day administration of ne national service must and should devolve upon them. qually it is obvious that, for the national coördination nd direction of their work, these local [illegible]mittees will ave to look to some central body, [illegible] which it is not to e a Central Medical Board, will [illegible] probably have to be a epartment of the Ministry of Health.

A USEFUL INNOVATION ?

Such a department would have the customary Civil ervice constitution, whereas in the Central Medical oard the doctors have been offered inside the Ministry n instrument of a new and different type. The Board s intended to be composed almost entirely of doctors; he Minister of Health would choose these doctors after lue consultation with professional organisations. But, nost important of all, the majority of these doctors vould be employed in a part time capacity, and for the est of their time would be actively engaged in the ractice of their profession outside the Ministry. This vould mean that we should have (as never before) a roup of representatives assisting in the executive dministration of the medical services, who would be n a position to understand the problems and difficulties f the doctors working in the service, for they would be lifficulties and problems that they themselves were laily facing. The potential value of such an innovaion is one that should not lightly be discarded, and nless it can be shown that some alternative structure ffers commensurate advantages, no hasty request hould be made to the Government to abandon the roject of a Central Medical Board.

Special Articles

MEDICINE AND THE LAW

Posing as Registered Practitioner

WHEN a man who does not possess the prescribed [illegible] is found guilty of posing as a registered [illegible] itioner, there is sometimes a moving story [illegible] on his behalf. Untoward circumstances [illegible] the worse for his treatment. In a recent case at the Old Bailey the third of these pleas could justifiably be urged. Against it, however, the prosecution could stablish an unromantic case of plain fraud.

Richard Charles Vernon Grey, 28, described as a psychologist, [illegible] found guilty after a first trial at which the jury disag[illegible] s. from a doctor at [illegible] d. and £12 12s. from [illegible] to the prosecution C[illegible] acting as locum tenens, having got the employment through an agency to which he gave the name of a doctor on the Register and describing himself as a bachelor of medicine and a bachelor of surgery (Durham) who had held two medical appointments. These statements were false. The doctors whom he was accused of defrauding gave evidence that he had shown skill, medical ability, and interest in his work, but that they would certainly never have [illegible] had known that he was not a [illegible]

A [illegible] court of a statement made by Grey. In it the accused said that while serving with the RAMC, from which he was discharged on medical grounds in June, 1942, he conceived the idea of becoming a doctor; he claimed to have had previous medical training but did not wish to disclose the details. After leaving the RAMC, the statement continued, he attended clinics in Manchester and London where it was taken for granted that he was a medical student and consequently he was allowed to be present at lectures, outpatients' clinics, and demonstrations. In October, 1944, he went to the agency, said he was a qualified practitioner, fil[illegible] was given a selection of [illegible] bining his work as a loc[illegible] ying on a consultant's practice as a psychologist in Harley Street. The cases he had treated in Harley Street were exclusively psychological; he had made no physical examinations apart from routine; he realised he had done wrong but he felt that his knowledge of medicine had been sufficient to enable him to assist the patients he had seen; there had been no complaint of his diagnosis or treatment. He desired to devote himself to psychological practice, for which he did not need to be a registered practitioner.

The court was informed of six previous convictions; the first of these was for stealing a doctor's name-plate. It was said that he had posed as a naval officer and had made a false statement in order to obtain an identity card. He asked the court to take into account, and deal with, three other cases of fraud. The judge, telling him he was "just an impostor," sentenced him to twelve months' imprisonment.

The British pu[illegible] dismiss the Me[illegible] monopoly and to [illegible] man with some [illegible] course of study [illegible] case may not sha[illegible] is on the Registe[illegible] indicate that he has not had a criminal career. Will the British public feel no disquiet on learning that a man with six previous convictions can set up as a psychologist in Harley Street at will?

HANDICAPPED CHILDREN

A CONSIDERED attempt to protect and educate the handicapped child and to maintain his health lies behind the new draft statutory rules and orders issued by the Ministry of Education. The regulations cover blind and partially blind, deaf, delicate, diabetic, and educationally [illegible] se with severe physical [illegible] and children with s[illegible] dicapped by blindnes[illegible] epilepsy, or aphasia is to be educated at a special school—in the case of blind or epileptic children a boarding-school. A child of the other groups may attend an ordinary school provided it caters for his special needs, and his presence does not affect the interests of the other pupils unfavourably. His needs are to be met in various ways: thus partially sighted and partially deaf children are to have favourable positions in the classroom, and whatever special furniture, apparatus, and equipment they need. The partially deaf child for instance [illegible] aring-aids if necessar[illegible] licate pupils are to [illegible] conditions, and are to get proper rest and nourishment; diabetics will live in hostels under medical and nursing supervision, and their school life will be modified as the doctor advises. Those who are backward educationally are to be taught individually, or in small groups, and given opportunities for practical work. An educational psychologist will recommend appropriate treatment for maladjusted children, and those with speech defects are to be given special training by a qualified speech therapist.

Safeguards for children who are to be boarded out have a special point just now. The authority must gain the approval of the Minister of Education for any boarding-out arrangements which are made. Boarding homes must be approved and must take not less than 15 handicapped pupils unless the Minister sanctions a smaller number. If a child is to be entrusted to a foster parent the authority must arrange for the home to be inspected before he goes there, during his first month there, and afterwards at least once a term.

Several important conditions must be fulfilled before special schools can be approved and recognised. Thus there must be adequate safeguards against fire, the curriculum must be appropriate to the pupils, the schools must be open to inspection, and not conducted for profit, and a medical record must be kept of every pupil. At institutions for further education of the disabled who wish to prepare themselves for employment there must be full-time vocational courses occupying at least 30 hours a week.

The school medical service for these handicapped children is to work in harmony with other health and education services in the area. Every child admitted for the first time to a maintained school is to be medically inspected as soon as possible afterwards, and in addition every child is to be inspected during his last year at his primary and his last year at his secondary school, as well as at other times if the authority directs it. He will also have a dental inspection as soon as possible after entering a maintained school and such other dental examinations as the Minister may direct. Parents are to have the chance of being present at the medical inspections and the first dental inspection, and the onus is laid on the authority of following up pupils who need treatment, referring them to consultants if need be, encouraging and helping them to get what treatment they need, and even with providing treatment if it is not otherwise available. The authority must also ensure that the pupils are clean and that schools and institutions are hygienic. The medical officer must have special experience in the type of disability from which the children he is examining are suffering.

In the event of the regulations not being fulfilled the Minister may withhold or reduce the grant. The whole trend of the regulations is enlightened, and though standards of examination and follow-up can no doubt be raised as opportunities occur, they certainly provide a workmanlike start.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED APRIL 14

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1215; whooping-cough, 1234; diphtheria, 438; paratyphoid, 2; typhoid, 8; measles (excluding rubella), 20,342; pneumonia (primary or influenzal), 661; puerperal pyrexia, 131; cerebrospinal fever, 70; poliomyelitis, 5; polio-encephalitis, 0; encephalitis lethargica, 2; dysentery, 463; ophthalmia neonatorum, 63. No case of cholera, plague, or typhus fever was notified during the week.

T' [illegible] ivilian sick in the Infectious Hospitals [illegible] ll on April 11 was 1159. During the [illegible] ases were admitted: scarlet fever, 35; [illegible]; whooping-cough, 7.

Deaths.—In 126 great towns there were no deaths from enteric fever, 1 (0) from scarlet fever, 12 (1) from measles, 3 (0) from whooping-cough, 6 (0) from diphtheria, 49 (7) from diarrhœa and enteritis under two years, and 13 (0) from influenza. The figures in parentheses are those for London itself.

Birmingham had 6 deaths from diarrhœa and enteritis.

The number of stillbirths notified during the week was 211 (corresponding to a rate of 31 per thousand total births), including 20 in London.

MEDICAL SOCIETY OF THE LCC SERVICE.—A meeting of the society will be held on Thursday, May 3, at 4.30 PM, at the County Hall, SE1, when Mr. J. R. M. Whigham, Mr. N. C. Tanner, Dr. B. Gottlieb, and Dr. H. E. S. Pearson will open a discussion on hæmatemesis.

In England Now

A Running Commentary by Peripatetic Correspondents

IN the second half of the great international match US *v.* UK, the former scores with wine, cafeterias, and the teaching of preventive medicine; the latter with laundries, newspapers, and Parliament.

The wine victory is a walkover, since England produces none at all, but I was pleasantly surprised at the excellence of some of the American wines. Champagne from western New York State seemed as good as I have ever drunk, and a Schoonmaker's Monrestel 1940 was a pleasing, light, dry red, rather like the *vin gris* one got around Chateauroux. I am told that with Schoonmaker's selections one cannot go far wrong. In general wines claiming to be similar to French vintages should be avoided in favour of those which do not sail under the protection of a foreign flag, thus raising of false hopes. The American cafeteria at its best—for example, Scholl's Colonial Cafeteria in Washington—is stupe ously efficient, cheap, quick, clean, quiet, with excell food in wide variety. For breakfast, at which I joined by most of the British garrison in Washingto get fruit juice, tinned figs, egg and potatoes, toast, j and coffee for eighteen pence.

The teaching of preventive medicine is too seriou matter to be dealt with in a paragraph, so let us pas the most striking example—with the rocket bomb-human ingenuity misapplied, the American laundry British war-time laundries may have their shortcomings but you have to visit America to have your clothes really scientifically shrunk, creased, and ruined. I am told that there are excellent Chinese hand laundries which do not employ bulldozers and mechanical button-removers, but I have not yet found one.

That I do not like American newspapers is probably just prejudice. They have more misprints than ours and of course are about 8 times the size. What I really dislike is their habit of deliberately not finishing a "story" on one page, so that one either has to be constantly turning over or refolding a thing like a circus tent, or must carry in one's head the beginning of half a dozen articles which may reappear almost anywhere. What is printed seems as good—or bad—as our own, but with the exception of the *New York Times*, there is little British news.

Finally, the machinery of Congress and the utterances of many of its members are recognised by most Americans as being respectively inefficient and irresponsible. We have our comics and morons in all parties at home, but peers do not introduce motions to withdraw all British troops from Europe, nor—if the food situation in the UK was what it is in the US—would a MP threaten "food riots" because of a 12% cut in meat. Nor would the chairman of a committee state that he would "see that our civilians were fed before anyone else."

Now suppose some American in Britain tells us what he likes and dislikes about us?

* * *

We are quite idle. Powers higher than the clouds, or at any rate out of sight and represented by an aura of initials, seem to have no use for us except as a reservoir from which to top up their own wells of man-power. The younger officers grumble a bit. Most of them have seen the straits of the hospitals at home and have a very natural inclination to bury home-sickness in hard work. They talk of "lack of organisation" and "official incompetence" as if these were as new as penicillin. I think that someone at the depot should explain that in size and complexity the Army bears the same relation to, say, ICI as ICI bears to the "Homeo-pharmacy" in the bazaar. It is beyond human capabilities to ensure that every man is employed every minute everywhere.

The older ones can take it. Five years or more in the Army have accustomed them to the creaking of the machine; have even given them an appreciation of comfort and idleness which may so soon be exchanged for all-night operating in the monsoon. The newly appointed non-medical company officer has left few non-professional duties for the faculty. Our radiologist fights what is, I believe, a successful battle against our natural insanitary habits. The ophthalmologist, victim of a chance remark that he drove motor-cars in reliability trials, breaks his nails and his heart in keeping the lighting set and the MT in working order. The mess committee spend their time in a hunt for gin in markets of all shades of grey. But the rest sit in the sun and look at the jungle.

For most of us this life is an introduction to the jungle that we first knew of from *Just-so Stories.* We live on the edge of it and if we take a walk in the cool of the evening we have a choice of a jungle path or a very dusty road through the empty paddy fields. This jungle is what the books call, I think, "light deciduous." When we came it was green and rank and silent; now it is burning brown and seems more open and less oppressive. And in compensation for the withering of the green, the trees are flowering scarlet and orange and the number and variety of the birds is amazing. The jungle noises [illegible] One afternoon there [illegible] the grass beside the of[illegible] a barking deer—or so we believe it to be; a few jackals yell at the moon. The spoor of animals can be seen all along the stream that runs through the camp, and, spurred by this, one officer built a makhan in a tree and bought a playful kid. He sat up for two nights, and early on the third shot a large panther. We all felt that he had justified us as old koihais.

Our Africans—we are an African hospital—are more successful with lesser game. It is dangerous to stray from the paths, for every run conceals a spring trap made from a four-foot sapling and a length of telephone wire. (I would not know where the latter came from.) They have caught porcupines and what we call "jungle cats"—I wish I knew their real names. The quills of the first are valuable for magical purposes—"plenty strong juju"—and the meat of both goes into the pot. I tried porcupine; it is better than ration beef. The dissection of the panther provided some curious observations on animal magic. All went merry as a wedding bell until the gall-bladder was reached. This was handled very gingerly, cut into small pieces, and buried deep. We were evidently very stupid fellows when we asked the reason.

* * *

This week my ego i[illegible] the task of removing [illegible] I shall turn to the [illegible] philosophic fillip. This consoles me for my failure to reach the medical high places dreamed of during interne days. I know my name will never be attached to a speculum like Sims, nor will I ever have a glandular honour like Littré. My realistic sense tells me not to expect to be a "grand old man"—in fact, that same clinical sense tells me if another four years go by without a holiday there won't be any old man.

For me there is but one claim to fame, and this is my challenge: I have the largest practice in the world dealing with bear injuries. Yes, I mean ursarian traumatology. In this Canadian sub-Arctic area the bear is the king of beasts. In a decade I have treated a goodly number of men injured by these grizzlies and Alaska browns. In many cases it is simply an autopsy; in others the victims are variously mangled by the ill-tempered brutes. The clinical details will not amuse you, but one swipe of a paw, I have observed, will shatter a femur and leave a leg hanging in ribbons.

A short time ago my wife admitted a man into our parlour. Being occupied in a small room at the rear of the house (one's plumbing connexions in the far north are more important than social connexions) I could but hear snatches of the conversation. My wife: "She chased you up a tree! My, she must have been mad at you." A short pause and then: "Really, bit your toes off! You must have been teasing her." That finished my catering to the large gut. Out in the parlour was a man with two toes and a piece of shoe neatly amputated by a bear that had treed him and actually nipped off the most dependent portion.

* * *

The doctor, doing an antenatal examination: "I suppose you know you have two babies here?"

The patient, having dissolved into tears and been duly comforted: "You don't understand—it's dreadful—only one of them is my husband's."

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

Sir John Orr's arrival at the House of Commons as member for the Scottish Universities is an event of great importance and he is welcomed by all parties with real cordiality. His sponsors were two independent members for another university. The other newcomer this week was Dr. Robert McIntyre who was elected for Motherwell as the first Scottish Nationalist member. When the Speaker called "New members wishing to take their seats . . ." Dr. McIntyre, dark-haired, slight, and fresh-complexioned, came up alone and unsupported, giving the regulation two ceremonial bows, and stood just behind the mace. He had disdained to have sponsors of another party and so was not accepted but directed to withdraw behind the bar of the House. Many people were willing to act as his sponsors. The two chief whips of the Coalition offered themselves; two doctors, one Labour and one Conservative, offered themselves and Dr. McIntyre toyed with the idea; two Labour MPs offered themselves. But Dr. McIntyre would have none of them. The Speaker in his refusal to accept the unsponsored MP relied on a rule of the House dating from 1668 and only once suspe[illegible] but finally after [illegible] disallowed, and [illegible] sponsors and made his protest after taking the oath of allegiance and signing the roll of members. And so ended a [illegible]

The d[illegible] is week was rath[illegible] Crimea conference report. For two tedious days the debate on the Requisitioned Land and War Works Bill crawled from one clause to another with slowness beyond understanding, and the Army Annual Bill proved to be an exercise ground for a small minority, chiefly the member of the ILP. A bright spot in the week was the Prime Minister's report on welfare arrangements in Burma which are much improved, but practically nothing was said on the medical side. A dark patch was the Prime Minister's indication of the horrors of Nazi concentration camps. General Eisenhower invited members of both Houses to go to Germany to see for themselves, and a party of 2 peers and 8 MPs, including Lord Addison and Sir Henry Morris-Jones, has already been. They have a grim story to tell.

QUESTION TIME

National Health Service

Mr. D. L. LIPSON asked the Minister of Health if he would issue a white paper on the new proposals for a National Health Service which he had put before the British Medical Association and which they had circulated to their members, so that members of the House of Commons and the public might also have an opportunity to consider the Government's revised scheme.—Mr. H. WILLINK replied: In my answer to Dr. Summerskill on April 12 I made it clear that there is as yet neither any revised scheme put forward by the Government on this subject nor any proposals of which publication in a white-paper or otherwise would be appropriate.—Mr. LIPSON: Does the Minister not agree that he has informed the BMA that if these new proposals are acceptable to their members he is prepared to recommend their acceptance by the Government? Is he really treating this House fairly when the BMA has been able to circularise these proposals not only to their 70,000 members, but also to all members of the public?—Mr. WILLINK: I think I made the position quite clear in the answers I gave last week.

Mr. A. BEVAN: Is it entirely proper for the Minister of Health to negotiate with an outside body legislation which is wholly different from that which this House has discussed in the form of a white-paper; and when does the Minister propose to tell us what the proposals are that he has discussed with the BMA?—Mr. WILLINK: I cannot tell the House what proposals there are, when there are as yet no proposals.—Mr. PETHERICK: Since when has it been considered undemocratic for a Minister of the Crown, or a private member, to discuss important issues with private bodies outside this House, including trade unions?

Why the Hurry?

Sir **Waldron Smithers** asked the Minister whether, in view of the divergence of opinion about the proposals in the health white-paper, and in view of the fact that many doctors, nurses, and patients were on active service, he would postpone the introduction of the Bill until after the general election.—Mr. **Willink** replied: I am not prepared to give any undertaking to that effect.

Mr. H. **McNeil**: Are we to understand from the answer that the Minister intends to introduce a Bill, based on the white-paper, before the General Election?—Mr. **Willink**: I cannot say the date, and I cannot say what the eventual form of the Government's proposals will be.

Artificial Insemination

Mr. T. **Driberg** asked the Minister if he could now make a full statement on the current experiments in artificial insemination of women; and if any births had resulted or are expected shortly to result therefrom.—Mr. **Willink** replied: So far as my information goes, this operation is being performed with donated semen on a small scale in this country in cases where at the joint request of the husband and wife the responsible medical practitioner has satisfied himself that it is desirable. I do not think that the subject as a whole is one which can be satisfactorily discussed within the limits of a parliamentary question and answer, but I think it right to say that I am advised that it would be a breach of the law to register as legitimate a birth which occurred as a result of this operation when the husband is not in fact the father of the child.—Mr. **Driberg**: Would the Minister consider consulting with the Leader of the House to see whether it is possible to find time to discuss this very important social issue?

Sir G. **Acland-Troyte**: Will the Minister bring in legislation to make this disgusting habit illegal?—Mr. **Willink**: There are many aspects of this matter, and I am quite certain that on some of them, at any rate, there would be no agreement. I am pursuing the inquiry into the whole matter. Sir **Patrick Hannon**: In the interests of common decency in this country, will the Minister make representations to the War Cabinet that this whole experimental scheme be brought to a conclusion? Dr. E. **Summerskill**: Will the Minister undertake to maintain a scientific calm in this matter, and not be stampeded by those who approach it simply from an emotional angle?

Supplies of Penicillin

Colonel A. M. **Lyons** asked the Minister of Health to what extent penicillin was now procurable at the direction of a medical practitioner; and what facilities existed for its immediate availability when it was prescribed.—Mr. **Willink** replied: The scheme for the wider distribution of penicillin to which I referred in my reply of March 8 is now in operation. Supplies of penicillin have been issued through the distributing centres to nearly all the larger hospitals in the country and may be obtained, on request, by any hospital which has a suitable case. I regret that supplies do not yet permit of the unrestricted distribution of penicillin through chemists and the usual trade channels, and a practitioner who requires penicillin for a patient must therefore obtain it from a hospital and not through the issue of a prescription to the patient.

Care of Scottish Children

Replying to a question Mr. T. **Johnston** said he had appointed a Scottish committee of inquiry consisting of 15 members of whom 8 are women. The committee's terms of reference are:

> To inquire into existing methods of providing for children who, from loss of parents or from any other cause whatever, are deprived of a normal life with their own parents or relatives, and to consider what further measure should be taken to ensure that these children are brought up under conditions best calculated to compensate them for the lack of parental care.

The chairman of the committee is Mr. J. L. Clyde, KC, and the members include Dr. Nora Wattie.

Committee on Medical and Nutritional Problems

Sir E. **Graham-Little** asked the Minister of Food the names of the members of the standing committee on medical and nutritional problems which had taken the place of other committees advising him on bread questions during the war years; and on what date that replacement took place.—Mr. W. **Mabane**, parliamentary secretary to the Ministry of Food, replied: The following are at present members of the standing committee which has since the early part of 1941 been consulted by my department on many questions connected with food and health:

Ministry of Health: Sir Wilson Jameson [illegible] Butcher, Dr. W. A. Lethem, Dr. H. E. Mag[illegible]

Ministry of Food: Sir Jack Drummond, DSC, FRS, Lord Horder, FRCP.

Board of Education: Dr. J. Alison Glover.

Medical Research Council: Sir Edward Mellanby, FRCP, FRS, Prof. S. J. Cowell, MRCP, Dr. B. S. Platt.

Department of Health for Scotland: Dr. Andrew Davidson.

Ministry of Agriculture and Fisheries: Mr. R. G. R. Wall.

Department of Scientific and Industrial Research: Mr. C. S. Hanes, FRS.

Ministry of Supply: Dr. A. J. Amor.

Ministry of Fuel and Power: Dr. S. W. Fisher.

Wheat Germ in Medical Products

Sir E. **Graham-Little** asked the Minister of Food whether wheat germ supplied to certain commercial firms producing patent foods and medicines was derived from any, and if so what, source other than home-grown wheat; and was he satisfied that no home-grown wheat was diverted to flour destined for manufacturing purposes in which the valuable nutrient constituents of the wheat germ would be useless and destroyed by the process of manufacture.—Mr. **Mabane** replied: Wheat germ supplied to firms preparing certain medical products is extracted from the wheat in the milling of flour for manufacturing purposes. This wheat may consist of home-grown or imported wheat. Manufacturing flour from which the germ has been extracted is as far as possible supplied for purposes where the processes involved would destroy the nutrients in germ.

Sir E. **Graham-Little**: Which are the proprietary medical products supplied with wheat germ separated from wheat in milling: what proportion of wheat germ thus resulting is supplied to those firms, and by whom is their selection determined.—Mr. **Mabane**: The medical products for which wheat germ is now supplied are: Bemax, Froment and CVB and preparations made by Allen & Hanburys, Glaxo Laboratories, Bickiepegs, A. C. Whitehead, and J. & M. Glaskie. The amount of germ provided for these products is less than 1% of the total germ contained in the wheat which is milled in this country. The selection of these products is determined by my department in consultation with the Ministry of Health.

Dental Board Elections

Lieut.-Colonel A. V. G. **Dower** asked the Lord President of the Council why, under the provisions of the Dental Board (Temporary Provisions) Order, 1945, S.R. & O., No. 315, it was regarded as necessary to continue the board in existence for another year without an election.—Mr. C. **Attlee** replied: The Order related only to the six elected members of the Board. Having regard to the substantial proportion of those entitled to vote who are serving in the Armed Forces, elections to the board for some time to come would not only involve great practical difficulties, but would also inadequately reflect the views of the electorate.

Naval Mental Hospital Staffs

Mr. P. W. **Jewson** asked the First Lord of the Admiralty whether the recommendations of the Rushcliffe report had been adopted in Royal Naval mental hospitals.—Captain R. A. **Pilkington**, Civil Lord of the Admiralty, replied: No. But the conditions of service of the Admiralty staffs concerned are being reviewed in the light of the report to determine what modifications are warranted. A decision on this matter will, it is hoped, be reached at an early date.

Classification of EMS Patients.—When a patient is admitted to an EMS hospital the authorities have to decide whether the Ministry of Health can be held responsible for the cost of treating him; and they must also ensure that the records show the number of Ministry of Health cases and the number of other cases. To help them in these tasks the County Accountants' Society published, in March, 1944, a *Classification of Patients* under the EMS Scheme, and since then the useful little analysis has run through two editions and three reprints. The third edition, revised (Pp. 62. 2*s.* 6*d.*), was completed in December, 1944, and can now be had from the secretary of the society, County Hall, Chichester.

Letters to the Editor

TEACHING OF PATHOLOGY

SIR,—Nobody will deny that the amount of information the medical student is expected to absorb is much greater than he can digest during his five or six years in statu pupillari. And, for this reason, a great deal is being done to remodel the curriculum, mainly by paying more attention to practice than to theory: in other words, by emphasising the art, rather than the science, of medicine. That such an attempt must fail is, I think, obvious, because it is far more difficult to learn a large number of disparate facts than it is to draw inferences from general principles that have been clearly apprehended.

It would not be going too far if one ascribed much of the burden of pathology in the bane of the medical student to the failure of his teachers to subsume many phenomena under wider and more inclusive concepts. Thus, for example, the student tends to imagine that living tissues are almost infinitely versatile, whereas in fact they possess only a limited possibility of reaction, which [illegible] underlying similarity. [illegible] tries to learn by heart [illegible] occur in tissues—who, [illegible] every morbid process as if it were sui generis—does so because he has been given no help in acquiring a wider understanding.

For instance, it is extremely rare to find a student who has apprehended the underlying identity of the processes that result in the healing of wounds, the repair of fractures, the formation of granulomata, the phenomena of inflammation, and the responses to particulate foreign bodies. If anyone doubts the truth of this indictment, he might well ask a student. "What is granulation tissue"; and, if he received any answer of wider generality than a series of examples of granulation tissue arising around gaps in soft tissues, he would indeed have found a most unusual student.

The presentation of pathology as a collection of morbid *conditions* is neither accurate nor interesting, whereas the idea of *process* can arouse the attention of even the most lethargic. In short, the student, who succeeds in grasping the concept of the organism as a self-maintaining, although continuously changing, pattern of orderly relations, is [illegible] pathology. [illegible] like histology [illegible] of facts, is far from a genuine comprehension of the subject.

Of course, attempts have been made to discuss pathology in terms of stimulus and reaction, as for example in MacCallum's textbook; but the student does not use such presentations, because, as he justly alleges, "they are no use for exams." And anyone who takes the trouble to look at a number of examination papers will easily convince himself of the truth of this assertion.

The philosopher of pathology has not yet been born or at least has not yet become vocal. But, although few would be so temerarious as to attempt the major synthesis that is needed, it should be possible to fill some of the gaps in the theoretical bases of the subject. It should not present insuperable difficulties to discuss [illegible]s the series of changes that occur in an [illegible] an *atomic*, system; that is to say, as the [illegible] a body in which the parts act differently [illegible] their combination. The whole picture of [illegible] process is delineated in Stalin's words [illegible] course, in a different connexion), "the [illegible]ween the old and the new, that which is [illegible] that which is being born, constitutes the [illegible]tent of the developmental process."[1]

It follows from the thesis here put forward that a comprehension of pathology depends upon its correlation with the findings of allied sciences and on appreciation of the fact that pathology is an integral part of the wider discipline of biology. If this is realised, there will no longer be so wide a divergence between the practical scientist and the speculative thinker. Biology (and, therefore, pathology) can gain at least as much as physics has gained by a closer relationship between science and philosophy.

London, W1. **A. PINEY.**

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[1] Stalin, J. Dialectical and Historical Materialism. London 1941, p. 9.

STRESS FRACTURES

SIR,—Dr. Hartley, in his letter of April 7, is surely speaking from a limited experience of march fractures of the metatarsus when he asserts that march, fatigue, or "stress" fractures are essentially incomplete. For example, in the last 160 march fractures of the metatarsus radiographed at a military hospital (in 143 patients) there was definite displacement in 8 and a definite complete fracture was noted in another 4, making a total of 7½% which showed complete fractures, as distinct from the medial crack, or even mere periosteal haziness, usually seen when the patient is first examined or (as in 8 cases in this series) a few days after a negative first examination.

It cannot be too clearly emphasised that there is nothing characteristic in the radiographic appearances of these fractures—exactly similar appearances are seen in patients giving a history of sudden pain in the foot after jumping from a height. The diagnosis is made from the radiographic appearances and the history, which, here at all events, is usually (*a*) sudden onset of pain at the seventeenth mile, or thereabouts, of a route march, or (*b*) pain the day after a long route march, usually twenty miles or more. I have not been able to trace any connexion between the history and the presence of displacement.

HUGH MORRIS.

PENICILLIN IN SYCOSIS BARBÆ

SIR,—Several authors[1] have recently reported success in the treatment of sycosis barbæ by local penicillin applications. In both of the first two series, the only ones reported in detail, there was some difficulty from irritation of the skin. Recently a case of dermatitis venenata due to contact with penicillin solution of high strength has been described by Barker.[2] But Garrod[3] has demonstrated that "nothing is likely to be gained by using high concentrations, particularly for local treatment." Only sufficient is necessary to maintain a supply at the infected site, bearing in mind that some will be lost by absorption or dilution with discharge, and serum also will have a destructive effect.[4] In the light of these observations it would seem that the ideal application for skin conditions should be of low strength.

I have treated a series of cases of sycosis barbæ with a spray of crude penicillin filtrate containing 4–10 units per c.cm. (for which I owe my thanks to Dr. C. J. Young and Mr. G. C. Holliday). In general, the cases were treated at outpatient clinics with a daily spray. In the only case admitted and treated four-hourly, a cure was effected in three days. In 14 cases of uncomplicated sycosis the following results were obtained:—

Cured after initial course	6
Cured, relapsed but cure repeated	6
Relapsed but final condition improved	2
Failures	0

Of 4 cases of sycosis with severe seborrhœa, the condition was improved in 2 and remained static in 2.

Treatment in most cases lasted three to six weeks, with daily attendance. In all cases, a slight exacerbation occurred during the first week (? due to liberation of toxins from destroyed organisms), and gradual improvement then took place. Only one case of eczematisation occurred, and this settled in a few days without treatment, both the sycosis and the eczema clearing completely by the end of the course.

Follow-up has only been possible for a period of up to three months, so a decision on the permanence of cure cannot yet be made; but there is no doubt that penicillin has proved a most valuable weapon against sycosis, sometimes of several years' duration and resistant to other types of therapy.

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[1] Roxburgh, I. A., Christie, R. V., Roxburgh, A. C. *Brit. med. J.* 1944, i, 524. Taylor, P. H., Hughes, K. E. A. *Lancet*, 1944, ii, 720. Sophian, L. H. *Amer. J. med. Sci.* 1944, 208, 577. May, H. B. *Brit. med. J.* 1944, ii, 847.

[2] Barker, A. N. *Lancet* 1945, i, 177.

[3] Garrod, L. P. *Brit. med. J.* 1945, i, 107.

[4] Bigger, J. W. *Lancet*, 1944, ii, 400.

The conclusions that I have reached from these studies so far are that weak solutions of penicillin are fully as effective in local therapy as strong ones, and that irritation of the skin and eczematous reactions are rare when weak solutions are used.

Royal Infirmary, Bradford. M. A. COOKE.

OUR TUBERCULOSIS SERVICE

SIR,—Two impressions are left on the ordinary practitioner reading the report of the Joint Tuberculosis Council's reorganisation committee. These are the costliness and the cumbersomeness of the machinery in the environmental treatment of tuberculous infection on the one hand, and on the other the puny efforts made to deal "with the seed and the soil." Certainly English experience is not going to be helpful to post-war European tuberculosis!

The committee mentions that one of the principles of the Astor report was that "provision should be made for increasing by way of research the existing knowledge of the disease and of the methods for its prevention, detection, and cure." It also states that as regards research, "official stimulus is lacking, statistical technique is elementary, and finance is meagre." This failure to carry out the fifth principle of the Astor report justifies the conclusion that the problem of tuberculosis as a whole does not receive adequate recognition. Perhaps this matter is prejudiced by the fiasco of the Spahlinger investigation which came to an end in Ulster in 1935. One would have expected the report would have made the bold suggestion of a tuberculosis research on the lines of the cancer one. This would be international in character and comprehensive enough to include medical and veterinary practice, and all micro-organisms resistant to chemotherapy. In this connexion I note in your issue of March 17 that a claim is made by French experimenters in Madagascar to have "softened" the lepra bacillus. In the prevention of phthisis the new housing programme seems to call for recommendations from the committee for ventilation of the home. A great desideratum is a practical method of ventilating without draughts the sleeping apartments. Perforated bricks are easily covered by paper and therefore useless. The gospel of fresh air, even in the native city of Dr. MacCormac, needs, as far as my observation goes, a fresh revival.

Belfast. R. M. FRASER.

IDIOPATHIC GANGRENE OF SCROTUM

SIR,—In view of Mr. Mair's article and your annotation of April 14, the following clinical notes may prove of interest.

A baby, aged 7 months, was recently admitted to the Peasley Cross Isolation Hospital, St. Helens, suffering from inflammation of the scrotum and perineum said to be of 6 days' duration. The child had had a generalised measles rash 6 days before admission and the mother had noticed a redness and swelling of the scrotum at the time of appearance of the rash. The baby was extraordinarily well-nourished and well cared for, the home was a good one, the mother careful and conscientious. No history of trauma to the skin of scrotum could be obtained.

The scrotum was about the size of an orange, with a red glazed surface. At the lower pole there was a black gangrenous area about the size of a threepenny piece. There was extensive cellulitis of the perineum and inner aspect of the thighs, extending upwards over the pubic area on to the lower abdominal wall. Antistreptococcal serum was at once given and sulphonamide therapy commenced, but in less than 24 hours after admission it became evident that the condition was one of extreme virulence and the child was, if anything, more gravely ill. A tentative diagnosis of *Cl. welchii* infection was made. In consultation with Dr. F. S. Mooney, pathologist to the St. Helens EMS Laboratory, it was therefore decided to commence treatment with penicillin. Within two days of commencing penicillin the extension of the cellulitis appeared to be checked. By this time, the abdominal wall was involved extensively and on the right side the inflammatory spread had almost reached the axilla. The gangrenous spot on the scrotum had spread and the entire scrotum was an unrecognisable tissue slough on which the testicles lay completely exposed. Cultures of pus from the extending gangrenous scrotal patch had by this time revealed profuse growths of *Staph. aureus* and *proteus* organisms.

In subsequent days—roughly from the 4th to the 12th day of penicillin treatment—there [illegible] of the inflammatory process in the [illegible] um, and abdominal wall. In the case of the latter there was extensive pus formation and by running the hand down the child's right side pus could be expressed through the ragged opening at the base of the scrotum where the spermatic cords emerged. Below this level the scrotum had entirely sloughed away. By the 15th day of penicillin treatment the thighs and abdominal wall were normal and pus formation had ceased. We were now left with what appeared to be the formidable problem of providing a tissue covering for the exposed testicles, and it was felt that the advice of a plastic surgeon might be obtained. But within the next 2 days—i.e., 16th to 18th from admission—profuse granulations appeared, and from thenceforward there was an amazingly rapid regeneration of the scrotal tissues. The scrotum was completely re-formed and healed in 8–10 days, and only a small puckered scar remained as evidence of the tissue destruction which had occurred.

The only local dressings employed were saline applications during the period of inflammation and sloughing, and a penicillin cream during the process of granulation and healing. The urine was kept alkaline during the whole course of treatment. Despite the use of a jaconette "mask" slipped over the penis, it was extremely difficult, owing to the age of the child, to prevent soiling of the wound with urine. This apparently had no adverse effect.

As in the case quoted by Mr. Mair, despite all appearances to the contrary conservative measures produced an end-result for which at one time one could scarcely hope.

I am indebted to Dr. F. S. Mooney, St. Helens EMS Laboratory, for his assistance and advice in the treatment of the case.

St. Helens. G. O'BRIEN.

A NATIONAL HEALTH SERVICE

SIR,—I am sure many will welcome your timely leading article on the 100% issue. Some members of the public have already gained the impression that we are fighting the 100% simply to preserve the goose that lays the golden egg and are less concerned with serving the sick than serving ourselves.

This impression, true or false as it may be, does little to encourage the layman to assist us to ensure that the great danger of bureaucratic stifling of courage and initiative in medical practice will not come to pass. Surely the energy wasted in fighting this issue could be more profitably employed in fighting other less selfish dangers inherent in the proposed National Health Service, such as excessive lay control and the lack of machinery for airing our grievances, as State-servants, to the public.

London, NW3. J. L. BOLDERO.

SIR,—Once grant that the plans for social insurance and for a comprehensive medical service are and must be interdependent and indissolubly linked and your sweet reasonableness in arguing the case for "100%" is scarcely needed. Few can really believe that either an income limit or contracting out are practical propositions.

But when you urge us to accept and coöperate you say almost nothing of the implications of acceptance. Sir William Beveridge, whose report displayed a candour in stating hard facts and unpalatable consequences conspicuously lacking in the white-paper, pointed out that if the scheme were adopted he could see no place for private practice (para 431) nor for voluntary subscriptions to hospitals (para 432) and he gave as one of his main reasons for demanding a "comprehensive service" "to ensure the careful certification needed to control payment of benefit at the rates proposed" (para 437). "Careful certification" in this context can, I think, only mean controlled certification—what other sense could it have?—and therefore, if Sir William is right, by accepting the comprehensive service linked with social insurance we are helping to put a final end to at least three existing free institutions—private practice, voluntary hospitals, and what might be and supply of medical attention.

Add to this the demonstration that in at least one important respect the State favours dependence and discourages independence in 100% of its citizens, and I find it hard to imagine a shrewder blow to those free institutions and personal liberties for which we say we have been fighting these five years

But this is not all. I have yet to meet any knowledgeable person who supposes that a comprehensive service corresponding with its white-paper portrait can be constructed inside ten years, and I have heard one eminent authority—a physician wholly in favour of such a scheme—give his own estimate as twenty five years. Is social insurance to wait until then while our unhappy profession is daily abused for holding it up, or is "Assumption B" to be satisfied by a kind of Portal bungalow of a medical service, all too likely to become a permanency, so that social insurance may begin?

Can no-one persuade the Government to separate these antagonistic partners, to proceed with a social insurance, solving its certification problems by whatever referees and assessment boards may be required, and to build the extended and reformed medical service we all desire with the single aim and the unhurried deliberation that so vast an undertaking manifestly demands?

London, N.W.3. **LINDSEY W. BATTEN.**

*** Sir William Beveridge gave as his first and chief reason for suggesting a comprehensive medical service, the need of ensuring early diagnosis and prevention of illness (para. 426). He nowhere suggests restrictive certification, and the Government Actuary (in the Beveridge report and again in the white-paper on social insurance) has allowed for a 12½% greater frequency of claims for sickness benefit under the new scheme than under National Health Insurance. Nowhere in the Beveridge report, in any white-paper, or in the new proposals, is it suggested that the certificates of doctors who have elected to remain outside the Service would be unacceptable when claims are made for sickness, disability, or other benefits. If such a suggestion were made, it would be strenuously—and, we believe, successfully—opposed by the medical profession. Para. 132, which Dr. Batten quotes, refers to hospital contributory schemes, the disappearance of which, and their replacement by a grant drawn partly from a universal contributory scheme, does not "put a final end" to the voluntary hospitals, whose position will be stabilised, and whose expectation of life will be much enhanced, if the new proposals are accepted —ED. L.

SUBCAPITAL FRACTURES OF FEMORAL NECK

SIR,—In his technically informative article of March 31 Mr. Wardle implies that bony union is the object of treatment and the criterion of success. Surely only if such capacity to walk as existed before the fracture is restored can a wholly satisfactory result be claimed? Far from having to forbid weight-bearing, it is difficult to get many of the elderly cases to resume walking, and it will doubtless be admitted that not a few fail to walk again, bony union or not.

Worksop, Notts. **M. HAYDON-BAILLIE.**

UNIVERSITY VOTERS

SIR,—Voting for university constituencies at Parliamentary elections is conducted by post, and voting papers are sent by each university electoral registration officer to the last recorded address of every elector, unless such address has previously proved insufficient.

In view of the impending general election I am writing on behalf of all university registration officers to urge every voter for a university constituency who has changed his address since registering as an elector and [illegible] ified the electoral registration officer of [illegible] such change, to do so as soon as possible. [illegible] has reason to believe that his name or [illegible] not correctly recorded in the register should also communicate with the electoral registration officer of his university.

There is little doubt that many electors have changed their addresses within recent years without notifying their [illegible] not only [illegible] many last-minute applications for voting papers but would help to ensure that those who have a right to receive voting papers receive them in time to record their votes.

University of Oxford. **D. VEALE,**
Registration Officer.

OVERHEATING

SIR,—Many years ago Lewis demonstrated the [illegible] away from the actual site of trauma, which was often no more than a pin-prick.

The MRC Report No. 249, *Studies of Burns and Scalds* (1944), describes loss of plasma from burnt surfaces through (1) tissue destruction and hence exudation, (2) plasma escape through widened pores of capillaries in deeper structures (into interstitial fluid), shown clinically by "œdema" best evident in the face, when this is slightly scorched. Plasma loss via the two routes is made up by [illegible] might be prevented.

Before the war I came up against this problem of "capillary leakage" (through widened intramural pores) in cases of experimental and natural heat-stroke where the venous hæmoglobin may rise from 100% to 150% or 180% in a few hours. At autopsy, in these heat-stricken cases, much free fluid may be found in the peritoneal cavity, in the pleural cavities, and in the pericardium. The paper describing this work was rather bulky and was not published but was prepared for Lord Cadman who encouraged the research. In our experimental heat-stroke cases, intramural pore-widening could be controlled, to some extent, by intravenous administration of polyvalent adrenal cortical extracts such as 'Cortin.' It is possible that the "whole" posterior pituitary also controls capillary size.

It is suggested that the "deep œdema" of heat-stricken or burned persons may be due to release of the "H" substance of Lewis from affected tissue cells, and the pore-widening component might be neutralised by cortin or posterior pituitary extract, administered intravenously.

FRANK MARSH.

THE MEDICAL SUPERINTENDENT

SIR,—From Dr. Lister's letter in your last issue I feel it is clear that he is not conversant with the duties and responsibilities of medical superintendents; he describes himself as amazed by the carefully worded reasons given by Dr. Somerville Hastings for their existence. Surely it must be obvious that medical "qualifications"—I assume that Dr. Lister means "knowledge"—will help a superintendent in dealing with complaints from patients and their friends, in allocating duties to the medical staff, in executing the instructions of the committee of management intelligently, and in using the available beds to the best advantage.

Dr. Lister seems to overlook the fact that hospitals are for one purpose and one only—namely, the treatment of patients—and that every decision that has to be made is an answer to the question "Is it in the interests of the patient or patients and the hospital as a whole?" The question "Is it in the interests of the staff or any particular member of the staff?" is only a secondary consideration.

Dr. Lister quotes Dr. Somerville Hastings as saying that "a good clinician is rarely a good administrator." This statement certainly needs qualification by adding the words "if he does not have the qualifications necessary to be one"; but the reverse does not necessarily follow, as Dr. Lister seems to argue—namely, "that a good administrator is not a good clinician."

It is difficult, I admit, to understand what a pseudo-specialist is. Putting it into English it means a false specialist—that is to say not a specialist at all—which of course is contrary to fact, for a medical administrator can be a specialist in hospital administration, and a much more efficient one than any lay specialist-hospital administrator, because of his medical knowledge. Also he can be, and usually has been, a specialist clinically, or, better, has had a wide range of experience in all branches of medicine before he was appointed as a medical superintendent. In either case he is able to have a comprehensive and intelligent knowledge and understanding of the needs of all specialists and take steps to see that they are met.

A lay administrator, as in voluntary hospitals in England, is appointed chiefly because he has to see that his hospital is kept in the public eye by means of advertisement and propaganda; he has to receive graciously voluntary gifts and collections made on behalf of the hospital, to organise events to obtain funds, and to be obsequiously subservient to all philanthropists—an occupation I admit totally unsuited for a medical man.

What a distorted picture Dr. Lister presents in his summing-up: it is so illogical; and pressed to its ultimate conclusion it would place even the most distinguished practitioners in a very bad light. I refer to his remarks attributing "domination of practising doctors *up to* consultant status by colleagues who have either failed or at the least lost interest in their calling to a great extent," speaking of them as men who have taken up administration as a second choice. Have not all specialists taken up their specialty as a second choice—and rightly so? What is the argument against having what he calls a foot in each camp? It is the close liaison between the purely lay and purely medical work of administration that will prevent there being two camps. Surely he does not think that a medical committee, as a corporate body, can attend to all the details of hospital administration, any more than a board of directors can do so in business; an executive officer is essential.

Am I fair when I sum up Dr. Lister's complaint by saying that he is a specialist but wants to be also a pseudo-administrator? Does he want to be able to say to a lay administrator, "I want this or that," and expect his request to be granted without question? Does he object to asking a colleague medical superintendent, who may realise that the request needs consideration, is perhaps unreasonable, unnecessary, and uneconomical, and not in the interests of the hospital, and would not wish to press the matter further to the medical committee because they too might be bound to support the medical superintendent's opinion? He too thinks that a lay chairman should be "responsible to the public he represents that they get the highest possible standard of hospital service"; he does not even recommend that the chairman of the hospital should preferably be a medical man.

Dr. Lister shows that he has a very poor opinion of the capabilities of his professional brethren, unless "up to" consultant status.

ERNEST C. HADLEY,
Late Medical Superintendent, City General Hospital, Leicester.

*** Dr. Lister is serving abroad, and any reply to this letter will be delayed.—ED. L.

INDUSTRIAL OPHTHALMOLOGY

SIR,—The Institute of Ophthalmology proposes to devote a considerable proportion of its funds to industrial ophthalmology. In view of the absence of any coordinated work in this field it is felt that a national survey of workers, and of work already accomplished, is a necessary preliminary to the undertaking of research on any specific aspect of this very extensive subject.

The institute therefore asks all who have routine experience in any branch of industrial ophthalmology, or who have undertaken original work bearing upon it, to communicate with the institute stating briefly their experience and defining the aspect of the work with which they are most familiar—medical supervision, safety, lighting, industrial psychology, &c. It is the institute's policy to promote the investigation of industrial ophthalmic problems in the districts in which they arise. It is hoped that those replying to this request will be willing to cooperate in their own areas and in their special fields of interest and experience as the national scheme develops.

This invitation is extended not only to individual workers but also to research and other organisations concerned. The funds will be distributed on the recommendation of the scientific executive committee in the form of grants for approved work. The committee propose, initially, to support, coordinate, and publish work undertaken throughout the country.

Institute of Ophthalmology, Royal Eye Hospital, St. George's Circus, London, SE1.

P. T. ETHERTON,
Secretary.

DORSAL DECUBITUS

SIR,—While not venturing to contradict Dr. Norman Glaister's theories, may I, as a nurse, point out that part of the nursing of helpless patients consists in frequently changing the position of the patient. [illegible] patients flat on the back and [illegible] bedclothes would not be good m[illegible]

Leytonstone.

D. G. MELROSE.

FACULTY OF OPHTHALMOLOGISTS

THE Council of British Ophthalmologists has sponsored the formation of a Faculty of Ophthalmologists (*Lancet*, Feb. 3, p. 156) which it is intended [illegible] a body representative of all British [illegible] The council of the faculty, elected by [illegible] the following regional and national representatives.

Regions	*Members*	*Associates*
1	George Black	—
2	Ida Mann	Doris Rose
3	W. Niccol	Moreen Whelton
4	Frank W. Law	J. A. Chivers
5	W. J. B. Riddell	Stewart Macky

National Representatives (Members)

P. G. Doyne
R. C. Davenport
Sir Stewart Duke-Elder
O. M. Duthie
C. B. Goulden

F. A. Juler
E. F. King
Sir John Parsons
H. M. Traquair
F. A. Williamson-Noble

At its first meeting the council elected the following officers:

President: Sir Stewart Duke-Elder
Vice-President: F. A. Juler
Hon. Treasurer: F. A. Williamson-Noble
Hon. Secretary: Frank W. Law

The council also elected standing committees on medico-politics, education and research, and remuneration and emoluments.

The criteria of membership and other details were necessarily temporary owing to the urgency of the political situation. These will naturally require modification, and with this in view a meeting has been arranged, under the chairmanship of the president of the Royal College of Surgeons, between four representatives each of the faculty, the ophthalmic group committee of the British Medical Association, and the Association of British Ophthalmologists.

ASSOCIATION OF SURGEONS OF GREAT BRITAIN AND IRELAND.—The annual meeting of the association will be held in London on May 2 and 3 at the Royal College of Surgeons, Lincoln's Inn Fields, WC2. On Wednesday, the 2nd, at 10.15 AM, Prof. Ernest Finch, Prof. J. R. Learmonth, Prof. John Kirk, Prof. W. G. Barnard, and Major-General W. H. Ogilvie will open a discussion on the education of the surgeon. At 2 PM the following will read short papers: Prof. Seymour Barling on Lawson Tait; Mr. A. Tudor Edwards, constrictive pericarditis; Major D. W. Harken, USA, foreign bodies in the heart and thoracic blood-vessels; Prof. T. Pomfret Kilner, skin grafting; Mr. K. H. Pridie, fractures of the os calcis; and Brigadier A. E. Porritt, the results of war surgery. On Thursday, the 3rd, at 10 AM, there will be a discussion on carcinoma of the rectosigmoid junction, when the opening speakers will be Mr. R. Scott Mason, Dr. Cuthbert Dukes, and Mr. O. V. Lloyd-Davies.

Obituary

HANS SACHS

M D

Professor Sachs, who died in Dublin on March 23, was one of the pioneers of serology who emerged from the school of Paul Ehrlich. For many years he was a centre of attraction for workers from many countries and did much to enhance the reputation of the Heidelberg medical faculty. After racial persecution had made him leave his own university in 1935 the Irish Medical Research Council enabled him to continue his work in the School of Pathology of Trinity College, Dublin. Here he was made welcome, but could scarcely hope to recover the influence and activity he had enjoyed as director of his own institute, as the academic representative of his subject, and as one of the founders and editors of the *Zeitschrift für Immunitätsforschung und experimentelle Therapie*.

Sachs was born in 1877, at Kattowitz in Upper Silesia. He qualified in 1900, and soon joined the staff of the Institute of Experimental Therapy at Frankfort-on-Main, where he eventually became professor and head of the department of experimental biology. From 1920 he was professor of immunology and serology and director of the scientific department of the Institute of Cancer Research at Heidelberg. His name, along with that of Georgi, associated with one of the first simple and reliable flocculation tests for syphilis, became a household word in laboratory technology. There is hardly a field in serology in which he did not contribute—notably hæmolysins, toxin-antitoxin reactions, the Wassermann reaction, chemospecificity ("haptens"), and auto-specific antigens. The Wassermann reaction was originally attributed to spirochætes present in extracts of syphilitic liver. The observation that extracts of normal animal tissues could be substituted for those of syphilitic organs disposed of this hypothesis; and in this change of opinion Sachs took a prominent share. He was among the earliest to show that cholesterol is a potent "activator" of extracts—a fact which has established the modern technique of extract-making for the serology of syphilis. The essential mechanism of the WR and the flocculation reaction was at that time obscure. Sachs and his co-workers in numerous researc

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together with Klopstock and Weil, he demonstrated that the serum of rabbits may be caused to react positively by injecting into the animals alcoholic extracts of rabbit-tissue along with a foreign protein, such as pig's serum (the latter being required as a "carrier" on the analogy of Landsteiner's work). Thus *inter alia* an antibody had been developed by the rabbits to tissue lipoids of their own species. These experiments led to many others that have increased our knowledge of the nature of antigens in general,

" or "masking" in various organs

blood-cells, brain, lens, and micro-

competition" and their specificity,

ficity of individual organs and even of different components of the same organ, as exemplified in the central nervous system. The significance of this research in relation to the genesis of many pathological conditions, particularly cerebrospinal syphilis

bvious. In later years Sachs's

were on blood-groups and his

g and the distribution of blood-groups in the Irish population (*Irish J. med. Sci.* April, 1940) is probably the best summary of knowledge on the subject before the discovery of the Rh factor.

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spirit of international cooperation, were assets in his work for the League of Nations commission for the standardisation of serodiagnosis of syphilis. Both in his institute and in his hospitable home he imparted scientific inspiration and teaching, and those who knew him well will recall the lively humour and humanity with which he revived the memory of great medical men who had been his friends.

"My contact with Professor Sachs," writes C. H. B., "extended over almost forty years and I remember most clearly the kindness and help which as a junior worker I received from him in his department at the Institute in Frankfurt in 1905–06. His fairness of judgment and the consideration which he gave to the work of others, irrespective of school or nationality, were an outstanding

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ss, it is greatly to be feared that the uprooting of Sachs from his own soil probably hindered the maturing of an even richer harvest."

EVAN LAMING EVANS

CBE M D CAMB., F R C S

Mr. Laming Evans, emeritus surgeon to the Royal National Orthopædic Hospital, London, died at Sidmouth on April 6.

He was born on Sept. 3, 1871, the son of Worthington Evans and of Susanah, daughter of James Laming of Birchington Hall, Kent, and his elder brother was the late Sir Laming Worthington-Evans, at one time Secretary of State for War. He was educated at Eastbourne College and Trinity College, Cambridge, and received his medical training at St. Bartholomew's Hospital, where he was afterwards house-surgeon. He graduated in 1896, became FRCS in 1899, and was awarded the Raymond Horton-Smith prize for his MD thesis in 1901.

His first contact with orthopædics began with his appointment as house-surgeon to the Royal Orthopædic Hospital, the oldest hospital of its kind in London, which since 1840 had been a main training centre in orthopædics. Here he gained experience which was to serve him well; but for a while the South African War intervened and he went out to join the Welsh Hospital Field Force as an assistant surgeon. In 1902 he was appointed surgeon to the Royal Orthopædic Hospital. About the time of his appointment to the honorary staff the manner of correcting deformity was beginning to change; until the end of the century manipulation and tenotomy had held the field, but now open operations began to be performed more often, and Laming Evans played a part in the change of technique, helping thereby to widen the scope of orthopædics. In 1905, at the instigation of the King Edward VII Hospital Fund, the Royal Orthopædic Hospital amalgamated with the National and City Orthopædic Hospitals to form the Royal National Orthopædic Hospital which was subsequently built in Great Portland Street. He rendered great and steadfast service to this hospital; his reputation constantly attracted a large number of patients to his clinic, and for many years he was a zealous chairman of the medical board. He was also consulting orthopædic surgeon to the West End Hospital for Nervous Diseases; to the British Post-Graduate Medical School, Hammersmith; and to the King Edward Memorial Hospital, Ealing. At various times he was president of the Harveian Society and of the orthopædic sections of the Royal Society of Medicine and of the British Medical Association.

Certain disabilities particularly interested him, and congenital dislocation of the hip was one of these. Lorenz, who had advocated treatment by manipulation and plaster cast, visited this country early in the century and Laming Evans was one of the first to learn the new technique. In the following years he gained a cumulative experience in the highly successful treatment of this deformity and embodied the knowledge gained in a paper on the late results of manipulative treatment of congenital dislocation of the hip (published in the *British Journal of Surgery* in 1922). Another disability which he studied with enthusiasm was paralytic talipes calcaneo valgus, which he was able to cure satisfactorily by Whitman's astragalectomy operation. It was on astragalectomy that he chose to write in the Robert Jones birthday book in 1928.

He was appointed CBE in 1920. He retired in 1936, but although his health was not good he gladly came back at the outset of war to work again in the outpatient department of the Orthopædic Hospital and so relieve the strain on a depleted staff. This service he continued until last summer, when he had to give up. He was the last surviving surgeon appointed to the staff of the Royal Orthopædic Hospital before the amalgamation of the three hospitals, and his long work for the hospitals will be gratefully remembered. He was also one of a small band who helped to promote the fuller recognition of orthopædic surgery as a specialty.

GORDON TRAVERS BIRDWOOD

M D CAMB., D P H.

Lieut.-Colonel G. T. Birdwood, who died at Deal on April 14, found time in his 78 years for two working lives. When he retired from the Indian Medical Service in 1920 he settled in practice at Deal, where his elder brother Field-Marshal Lord Birdwood holds the ancient office of captain of the castle, and both as doctor and citizen he contributed much to the life of the town. He was educated at Clifton College and Peterhouse, Cambridge, and he qualified at Guy's Hospital in 1892. In the same year he came second in the entrance examination for the IMS and received his commission. During the 'nineties he served with distinction in the Abor and Waziristan expeditions and the Tirah campaign. In 1903 he became principal of the medical school at Agra, and his success in raising the standard of its teaching and extending its buildings was recognised when seven years later he was appointed to the new chair of midwifery at Lucknow Medical College. He was elected a fellow of Allahabad University and served on the child-welfare committee of the province.

At Deal Dr. Birdwood took an active interest in the district war memorial hospital, where he was senior surgeon until 1937. Two years previously he had started the ophthalmic department there, and he was a live member of the management committee. For ten years he acted as medical officer to the child-welfare centre work to which he was wholeheartedly devoted. He also took a prominent part in civic affairs. In 1929 he presided over the chamber of trade, for six years he was a member of the borough council, and when he died he was deputy mayor.

FRANCIS FREDERICK MUECKE

CBE, MB ADELAIDE, FRCS

Mr. Muecke, who died on April 13, was an Australian, but came to London in 1903 and worked from 1909 at the London Hospital, where he was a good friend to many generations of students.

Son of the Hon. H. C. E. Muecke, he was born at Adelaide on Dec. 6, 1879, and educated at the Prince Alfred College, where he was in the same class as the late Harold Chapple of Guy's. At Adelaide University, which he represented in cricket, lawn-tennis, lacrosse, and rowing, he graduated in 1902 with first-class honours, and two years later he entered on his specialty with an appointment as clinical assistant at the Throat Hospital, Golden Square. He became assistant surgeon to the London Throat Hospital in 1908, and in the following year, when he took his fellowship, aural registrar and demonstrator at the London. He also held appointments as aural surgeon at Maida Vale, and outpatient aural surgeon at the Belgrave Hospital, and wrote on vocal irregularities, voice production, auditory re-education, and the nasal septum. He was assistant surgeon to Golden Square from 1914 to 1919, but for almost all this period was away on war service with the RAMC. He was present at the Suvla landing at Gallipoli, and at the offensives of the Somme, the Ancre, Arras, and Passchendaele, being mentioned in despatches. Eventually he was transferred, as lieut-colonel, to the Royal Air Force, in which he was specialist for the ear, nose, and throat. Returning with a military CBE, he was appointed surgeon to the ear, nose, and throat department at the London Hospital, and in the next few years produced papers on nasal obstruction, symptomless mastoiditis, hemi-laryngectomy, and aural meningitis. He became a consultant to the London County Council, and in 1935 presided over the ear, nose, and throat section of the British Medical Association at its Melbourne meeting.

C. K. writes :

"It was always a pleasure to work with Muecke. Friday afternoon in the operating-theatre was a happy time. His great-hearted personality covered [illegible] sisters, housemen, instrument-me [illegible] He was always on time, always human. He was big in every way. In morning coat, and grey top-hat, he was magnificent His straight honest blue eyes under the great shaggy eyebrows welcomed the world he lived in. He had a wonderfully quick grasp of a humorous situation, and his deep knowledge of human nature made him a master at dealing with patients. His was one of the best consultant practices in London : doing duty for him, one realised that duchesses and doormen paid him equal tribute.

"He profoundly influenced those of us who come after him He was a pioneer in understanding the true physiology of the nose, and its great importance in health and disease. 'You can't do better than Nature, laddie.'

"He lived a full life. One can picture him, newly roused from sleep, directing rescue work after an appalling train crash outside his casualty clearing-station at Étaples. Or, himself a casualty, propped up in bed, operating on a soldier's mastoid He loved students and the medical school. He was a grand lecturer. As surgeon to nurses, he was devotion itself.

"The last glimpse was just before his death in the private wards of his hospital. 'Wouldn't be anywhere else, laddie' Muecke loved the London, and the London loved him."

Mr. Muecke was twice married, in 1905 and in 1930, but had no children.

EMPLOYMENT OF EPILEPTICS

EPILEPTICS are unfortunate among patients in having a disease which gives them relatively little trouble or discomfort, yet sets them apart from their fellows and embarrasses their friends. In the United States, the Laymen's League of Epilepsy has long worked to establish in epileptics a quiet self-confidence, despite their disability, and to encourage them to take a normal part in the life of the community. It is now announced[1] that in future the name is to be the American Epilepsy League Inc., "to emphasise the continental scope of the League's work and to avoid confusion with the physicians' group." Members, many of whom are epileptic, are drawn from all over the world, and the league has lately been accepted as an associate member of the American National Health Council.

War has opened many doors to epileptics, and Mr. Bernard F. Hibbard, the vocational director of the league, has worked with employers, State and local employment agencies, and various Service reablement organisations to place patients in suitable work. Books and pamphlets sponsored by the league have been supplied to the Services, and the US Employment Service has published general rules for its officers to follow when placing epileptics in industry.

Those placed are self-supporting ; their earnings amount to more than $120,000 annually, and they have contributed not less than $14,000 to taxes. Only 2% of them have had fits which interfered with work, and the maximum time lost by any individual was 48 hours. As this man was paid by the hour he cost his employer nothing. The average loss of time was 15 hours out of 2100 possible working hours. There was only one accident of any kind among them, and that was not caused by a fit but by carelessness. Less than 1% of them made any claim on a casualty company. It would be interesting to know the numbers of employed epileptics to whom these figures apply ; but even if the group is small it demonstrates clearly that suitable epileptics can work in industry with advantage to themselves and their employers.

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[1] *Epilepsia*, 1944, 2, 264.

On Active Service

CASUALTIES

KILLED

Flight-Lieutenant Sydney Wetherell, LMSSA, RAFVR

WOUNDED

Captain N. N. Levinne, RCAMC

AWARDS

MC

Major P. C. Mitchell, MB ABERD., RAMC
Captain Robert McIlwraith, MB GLASG., RAMC
Captain J. A. Tulloch, MB EDIN., RAMC
Lieutenant S. W. Pleasants, RAMC
Lieutenant David Train, RAMC

MENTION IN DESPATCHES

Surgeon Lieutenant A. J. Whitaker, MB LOND., RNVR

ALLIED AWARDS

SOLDIER'S MEDAL OF THE USA

Captain James McLean, MB EDIN., RAMC

ORDER OF THE STAR OF NEPAL, IV CLASS

The late Captain Barnett Freedman, MRCS, RAMC

MEMOIRS

Captain Albert Brown, RAMC, who was killed on Jan. 9 at the age of 29, was the youngest son of the late Mr. James Brown, of Springboig, Glasgow. Educated at Eastbank Academy, where he was gold medallist, and at Glasgow University, he graduated B Sc in 1935, and three years later obtained his MB with commendation. He spent six months as house physician with Dr. John Middleton in Glasgow Royal Infirmary before he became assistant in a general practice in Galashiels. Early in 1940 he volunteered for the RAMC and soon afterwards was drafted to the Middle East where he was employed on malarial control. During the final campaign for North Africa he was with the Eighth Army, and he came back to this country last April to take part in the landing in Normandy on D day. He was in the hard fighting round Caen, in the Nijmegen salient and on the Maas.

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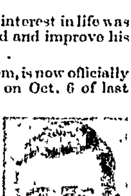
His games were golf and tennis, but his chief interest in life was medicine, and he constantly strove to extend and improve his knowledge.

Captain J. H. Keesey, missing since Arnhem, is now officially reported to have died as a prisoner-of-war on Oct. 6 of last year. The only child of Captain G. E. H. Keesey, Rifle Brigade, who was killed in the last war, and of Mrs Keesey of Fisherflat, Westmorland, he was educated at Wellington College, and Clare College, Cambridge. He took his medical training at St. Thomas's Hospital

1940. After
he joined
h he served
as MO to the 2nd battalion of the Gloucesters, but he soon volunteered for service with paratroops and he was wounded in the North African airborne landing in 1942. He recovered in time to take part in the campaigns in Tunisia, Sicily, and Italy. Early last year he returned to England and on Sept. 17 he landed with the 1st airborne division at Arnhem where he is known to have done fine work in caring for the wounded throughout the battle. He had married in 1942 Susette Harvey, younger daughter of the Bishop of Cashel. He died a few weeks before his 29th birthday.



Flight-Lieutenant Wetherell studied medicine at Guy's Hospital and qualified LMSSA in 1941. After a few months in general practice he was commissioned as flying-officer in the medical branch of the Royal Air Force Volunteer Reserve. He was killed by enemy action while serving as medical officer to a squadron overseas.

Notes and News

INTRAPERICARDIAL PENICILLIN

Penicillin has been successfully given into the pericardial sac in a case of purulent pericarditis, presumably pneumococcal.[1] The patient was treated for pneumonia with sulphadiazine for 4 days before admission to St. Luke's Hospital, Davenport, Iowa. There were clinical and X-ray signs of consolidation of the left lower lobe and the sputum contained pneumococci. Typical signs of a pericardial effusion were also present. She was given sulphadiazine for a further 5 days, with oxygen by BLB mask and digitalis, but her temperature remained at 102°–104° F. The sulphadiazine was then stopped, and penicillin, 15,000 units, was given every 3 hours intramuscularly; after 3 days the patient seemed no better, her temperature still being 103° F. A pericardial paracentesis was therefore done and 70 c.cm. of turbid blood-stained fluid removed: 40,000 units of penicillin in 30 c.cm. of isotonic saline was then introduced directly into the pericardial cavity. Within 16 hours her temperature fell to normal. The intramuscular penicillin was continued for 4–5 days; and her subsequent cure was uneventful. The pericardial fluid removed was unfortunately not examined bacteriologically.

RHEUMATISM CLINIC IN DUBLIN

A clinic for adult walking patients with rheumatism, set up in Dublin in October, 1942, has now published its first annual report. On weekdays the clinic remains open until 7 PM so that patients can come for treatment after work. All are seen by appointment, and this plan has worked smoothly; failures to keep appointments are rare. The clinic is well equipped for hydrotherapy, and heat, light, and electrical treatment including short-wave therapy; it has its own X-ray plant and laboratory. So far, 1676 patients (1034 women, 642 men) have attended 27,798 times, and results in patients who had completed treatment by the end of 1943 were 59% cured, 20% much improved, 20% improved, and only 1% unchanged. Varieties of rheumatism treated included fibrositis, rheumatoid arthritis, osteo-arthritis, ankylosing spondylitis, and gout; 6% of the total cases were attributed to psychoneurosis and 12% of the rheumatic group were complicated by psychoneurotic symptoms. The clinic was set up, with the help of a grant from the Hospitals Trust Board, by the Dublin Rheumatism Clinic Association, for the Minister of Local Government and Public Health. The Association is a public company without power to distribute profits; any surplus is used to further its objects, and it is hoped in time to establish and maintain other clinics for rheumatism, to promote research into the causes and cure of the disease, and to undertake postgraduate teaching.

IMPROVEMENTS IN PHOTOMICROGRAPHIC APPARATUS

At a meeting of the Association for Scientific Photography on April 21, Mr. Edward Machie, FRMS, considered the defects inherent in existing photomicrographic equipment. He suggested that by using modern machine-room techniques a compact precision apparatus could be produced capable of being used horizontally or vertically, measuring some 20 inches in overall length, and having accurate centring of the light-train. Other members mentioned the need for good reflected-light equipment and the problems introduced by inclusion of an incubator. It was agreed that a radical redesign of equipment is needed; and anyone having views on this subject is invited to communicate with the hon. sec. of the Association, at Tavistock House North, Tavistock Square, WC1.

Moral Welfare of Children

The annual meeting of the Children's Moral Welfare Committee for the boroughs of Holborn, St. Pancras, and Hampstead, will be held at the Holborn town hall next

speakers will include
nor of HM Borstal
od, formerly assistant
The committee was established 20 years ago, and its chairman is Dr. Mar. Moncrieff. The secretary's address is 93A, King Henry's Road, London, NW3, and the meeting is open to all.

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1. Wise A. W., Shafer, L. E. *J. Amer. med. Ass.* March 10, 1945, p. 583.

University of Oxford

An election of two members of the board of the faculty of medicine will be held on Wednesday, June 6. Nominations, which must be signed by six members of the general medical electorate, will be received by the secretary of faculties at the University Registry up to 10 AM on Wednesday, May 16.

Royal College of Surgeons of England

A meeting of fellows will be held at the Royal College of Surgeons of England, Lincoln's Inn Fields, London, WC2, on Tuesday, May 1, at 3 PM, when there will be a discussion on the present state of negotiations on the Government white-paper on a national health service.

The following lectures will be delivered at the College, Lincoln's Inn Fields, WC2, during May:

Hunterian Lectures.—Mr. A. S. Aldis, injuries of the pancreas (May 4); Mr. R. W. Watson-Jones, limb and spine injuries due to flying accidents (May 10); Prof. James Patrick, supination and pronation, with special reference to the treatment of forearm fractures (May 31).

Arris and Gale Lectures.—Prof. F. Davies, the early development of the human embryo (May 7); Dr. D. V. Davies, the synovial membrane and the synovial fluid of joints (May 9); Mr. Judson Chesterman, alterations of the neuromuscular balance of the intestine (May 11).

Lectures by the Research Professor in Ophthalmology.—Prof. Arnold Sorsby, blindness in Great Britain (May 25); penicillin and gramicidin S in ophthalmology (May 29).

The lectures, which are open to medical practitioners and advanced students, will be held at 4 PM each day.

University of Glasgow

On April 14 the following degrees were conferred:

MD.—J. H. Stirrat (with commendation); A. A. Gilmour.

Bellahouston medals for "eminent merit" in MD theses were awarded to Dr. A. W. Kay and Dr. J. H. Lawson.

National University of Ireland

The following appointments have been made:

University College, Dublin.—Dr. E. J. Conway to the chair of biochemistry; Dr. T. W. T. Dillon to the chair of pharmacology and therapeutics.

University College, Cork.—Dr. Owen Laughnan to a lectureship in therapeutics; Dr. James Hackett to a lectureship in dental surgery.

Prof. James O'Connor has been appointed representative of the university on the General Medical Council, in place of the late Dr. Denis Coffey.

Scottish Conjoint Board

Having passed the final examination the following have been admitted licentiates of the Royal Colleges of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow:

R. J. G. Aitken, O. E. A. Antia-Obong, Henry Baytch, I. J. Bernstein, A. E. R. Campbell, I. G. Campbell, J. D. C. Campbell, Henry Camrass, Bernard Chromow, David Craig, G. C. Fletcher, Aubrey Gerber, A. A. Holder, Alexander Ingram, J. M. Leith, Thomas Leven, W. E. Lotfy, Alison M. Matheson, A. A. A. Mazen, J. M. Moore, R. E. Morgan, M. N. Padayachee, F. L. Paterson, T. W. Poole, W. E. Robinson, J. C. Rohan, A. L. Rose, D. H. Rosenberg, I. J. Selikoff, H. J. Shapiro, Percy Shenkin, Mendel Silver, D. H. Sinclair, Paul Steinlauf, James Waddell, R. R. Wilson, James Wotherspoon, and Max Zimnowitz.

The following graduates of recognised foreign universities were also admitted to the licentiateship: Johann Weiss, MD GRAZ; W. C. S. von Reybekiel, MD BERNE.

Royal Society of Arts

On Wednesday, May 9, at 1.45 PM, at the house of the society, John Adam Street, Adelphi, WC2, Dr. F. M. R. Walshe will speak on the treatment of infantile paralysis.

Parliamentary Candidate

Dr. D. Stark Murray has been adopted as Labour candidate for Richmond.

Royal Society of Medicine

On Tuesday, May 1, there will be a meeting of fellows at 5 PM. At the same hour at a meeting of the section of orthopædics Mr. A. S. Blundell Bankart, Major W. E. Tucker, Mr. W. Harvey Gervis, Dr. L. B. Blomfield, and Dr. E. J. Crisp will read short papers. On May 2, at 2.30 PM, at the history of medicine section Dr. E. Ashworth Underwood will speak on Wilhelm Konrad Rontgen, and Sir Walter Langdon-Brown on Clifford Allbutt. On May 4 at the section of otology, at 10.30 AM, Mr. Colin Johnston, Squadron-Leader T. M. Banham, and Mr. W. O. Lodge will open a discussion on chronic suppurative otitis media. The section of anæsthetics will meet at 2.30 PM on the same day when Dr. John Gillies will speak on anæsthesia in operations for closure of patent ductus arteriosus, and Dr. George Graham on the preparation of the diabetic patient for operation.

Lectures on Ophthalmology

On April 25th Prof. W. J. B. Riddell gave the first lecture of a series to be held in the department of ophthalmology of the University of Glasgow on Wednesdays at 8 PM. Other lecturers will be Dr. G. H. Bell, vision and sound in cinematography (May 2); Mr. J. S. Tough, plastic surgery of the eyelids (May 9); Miss D. E. Feather, orthoptic treatment of squint (May 16); Dr. R. W. Pickford, defects of colour vision (May 23); and Mr. W. B. Inglis Pollock, Arabian and mediæval ophthalmology (May 30).

Society for the Relief of Widows and Orphans of Medical Men

At a meeting held on April 11 Dr. R. A. Young, the president, brought to the notice of the directors that their present secretary, Dr. E. J. Blackett, had held office for 40 years and his father, Dr. J. B. Blackett, for 37 years. Together they had thus been in office for little short of half the 157 years of the society's existence.

A new list of members has been printed and copies may be had from the secretary, 11, Chandos Street, London, W1. Membership is open to any registered medical man who at the time of his election is residing within a 20-mile radius of Charing Cross. Relief is granted only to widows and orphans of deceased members. The annual general meeting will be held on May 23.

Appointments

ABERNETHY, MARGARET, MRCS: examining factory surgeon, Long Melford, Suffolk.

GILL, R. A., MB LOND.: surgical registrar, St. Thomas's Hospital, London.

HASLAM-FOX, H. C., MB EDIN.: examining factory surgeon, Ormskirk, Lancs.

SIDDONS, BERTRAM, MB EDIN.: examining factory surgeon, Newport, Mon.

YOUNG, A. K., MB GLASG.: examining factory surgeon, Tarbert, Argyllshire.

ZIEVE, I. E., MA CAPE TOWN, FRCS.: surgical registrar, Charing Cross, London.

Colonial Medical Service.—The following appointments are announced:

BOASE, A. J., MRCS, DOMS: ophthalmologist, Uganda;

BUCHANAN, J. C. R., MD EDIN., FRCPE, DTM & H: Inspector-General, South Pacific Medical Services;

CHARTRES, J. E., BM OXFD: MO, Nigeria;

DAVIES, J. N. P., MB BRIST.: MO, Uganda;

MCKELVIE, A., MB: MO, Nigeria;

LAURANCE, B. M., MRCS: ophthalmologist, Trinidad;

TROWELL, H. C., MD LOND., MRCP: physician, Uganda.

Births, Marriages, and Deaths

BIRTHS

CROSSE.—On April 13, in London, the wife of Lieut.-Colonel J. H. J. Crosse, OBE, RAMC—a son.

HAGGIE.—On April 15, at Stamfordham, Northumberland, the wife of Captain M. H. K. Haggie, MC, RAMC—a son.

HOLLINS.—On April 15, at Oxford, the wife of Dr. Charles Hollins—a son.

MOORE.—On April 21, at Guildford, the wife of Captain B. P. Moore, FRCS, RAMC—a daughter.

MORSE.—On April 14, at Bognor Regis, the wife of Dr. P. W. Morse—a son.

SCOTT.—On April 14, at Woking, the wife of Flight-Lieutenant O. L. S. Scott, MRCP, RAFVR—a daughter.

MARRIAGES

BARKER—RASEY.—On April 19, a[illegible] Bailes Barker, captain RAMC, to Hilda [illegible]

MCKELVEY—ROPER.—On April 12, [illegible] Patrick Hubert McKelvey, lieut.-colonel RAMC, to Jean Roper.

MURRAY—SPENCER-SMITH.—On April 9, at Aldershot, Robert [illegible] Murray, captain RAMC, to Patricia Spencer-Smith, QAIMNS(R).

SATOW—HARDING.—On April 12, at Bath, Lawrence Satow, MC, MRCS, to Ann Harding.

DEATHS

AVETOOM.—On April 7, at Chichester, Sarkies Thaddeus Avetoom, LRCPE, lieut.-colonel IMS retd., aged 90.

BELLINGHAM SMITH.—On April 19, at Felsted, Essex, Guy Bellingham Smith, MB LOND, FRCS.

BIRDWOOD.—On April 14, at Walmer, Kent, Gordon Travers Birdwood, MA, MD CAMB., DPH, lieut.-colonel IMS retd., aged 7[illegible]

GRUBER.—On April 15, Rudolph Gruber, MD VIENNA, MRCS.

JOHNSTON.—On April 12, at Frome, Somerset, Charles Herbert Farley Johnston, MD LOND., aged 63.

LAWFORD KNAGGS.—On April 16, at Newton Abbot, Devon, Robert Lawford Knaggs, MD, M CHIR, CAMB., FRCS.

MACWATT.—On April 14, Sir Robert Charles Macwatt, CIE, MB EDIN., B SC, FRCPE, FRCS., major-general late DGIMS.

WHITE.—On April 16, at Crowborough, Edwin Francis White, FRCS, formerly of Putney, aged 86.

WOUNDS OF THE KNEE-JOINT

B. H. BURNS MB CAMB., FRCS
R. H. YOUNG MB CAMB., FRCS
G. M. MULLER MB LOND., FRCS
SURGEONS TO AN EMS WAR HOSPITAL

THE results of treating gunshot wounds of the knee have steadily improved since the beginning of the last war. In the official history of the Great War, Frankau said (1922): "In the early stages of the war, attention was concentrated on drainage to the exclusion of all other methods of treatment. With the exception of some sim-

lamentable." The introduction in 1916 of excision of wounds and suture of joints was a great advance. Since then, with the exception of delayed primary suture of the wound, which became popular in 1918, there has been little change in the operative treatment of this injury.

Nevertheless, Buxton in his Hunterian lecture (1944) showed that the results in 237 wounds of the knee in the second and third Libyan battles of the North African campaign compared very favourably with those in Barling's survey of similar wounds in 1917. The figures were as follows:

	France 1917	N. Africa 1941–42
Total wounds of the knee	845	273
Deaths	8·5%	2%
Amputations	19·4%	4·4%
Suppurative arthritis	?	31·8%

The main difference in the treatment of the cases in North Africa and in the last war is that the North African cases had the benefit of the sulphonamides. *Today the results that are being obtained with penicillin*—and ours are typical of those at other centres (Ellis 1945)—show still further improvement.

RESULTS IN 101 CASES IN 1944

This paper is an account of
knee admitted to the EMS
(June 6) and the middle of O
was a transit hospital we were
cases until their treatment
assess the effects of treat
the hospital they either we
hardening, or were discharged from the Army. Our worst cases have been retained for six to nine months. The condition of 101 cases on leaving the hospital was as follows:

Normal knees	65	75	Useful knees	15
Will be normal	10		Stiff knees	11

There were no deaths and no amputations. All but 5 of the wounds were healed at six months; these 5 had a sinus from cancellous osteitis.

In the category "normal knee" we have included those who had a normal appearance, and a full painless range of movement when they left the hospital. A few of these had bone damage to an extent that may give rise to osteoarthritis later. The category "will be normal" includes those with minor injuries who left the hospital one to three months after wounding with almost full restoration of function, and in whom complete recovery was only a matter of a few weeks. Those in the categories "useful knees" and "stiff knees"—the failures—are analysed in more detail later.

Small punctured wounds not requiring excision but with hæmarthrosis are included in this series (16 cases), as also are gross comminuted fractures of the lower end of the femur in which the knee-joint was opened (8 cases.)

TREATMENT

Most of the patients arrived here in Tobruk plasters two to eight days after wounding. In the first few days, before operating facilities had been established in France, patients were received with only a field dressing on their wounds. But from then on, all except small punctured wounds had been excised within 24 hours of wounding. After excision the synovial membrane had been sutured when possible. The great majority of wounds had been lightly packed with sulphanilamide and soft paraffin
been employed. Sixty
serious ones, had had
here; 28 had intra-articular injections only, 14 had intramuscular injections only, and 16 had penicillin by both routes; 2 had penicillin tubes in the wound. The primary treatment they had received in the Army was clearly of very high standard.

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infection of the wound with a sterile joint cavity. There was a remarkable absence of streptococci and staphylococci; in only 2 cases of gross bone-destruction with a widely o
wounds c
some dip
Ps. pyocyanea was reported.

When anatomical factors allowed, the wounds were sewn up on sight. Suturing in layers was always attempted, and, although in many instances it was not possible to close the synovial membrane, an effort was always made to sew up the capsule and the skin completely. It was considered more important to prevent
the access of cessation
of penicillin noxious
gram-negativ ances be

0 patients were given
with small uninfected
punctured wounds were given one intra-articular injection after aspiration; no more was necessary. Of the other cases, the first few had intra-articular penicillin only, because it was thought necessary to get the drug into the joint cavity and penicillin in the blood may not traverse the synovial membrane. *After a short time,* however, when we had had two cases of extra-articular abscesses due to gram-positive organisms with a sterile joint cavity, we realised that the chief danger was infection of the periarticular tissues. We therefore decided

be secured by an intra-articular
rse of parenteral penicillin was
for five days.

In only 3 cases were penicillin tubes used, and that was when the joint could not be completely closed.

RESULTS OF SUTURE

Of 76 cases completely sutured at the first inspection of the wound, 61 In 4 others
the wound was h in 11 a sinus
developed in one o completely
sutured joints, 4 contained pus (*Bact. coli*) at the time they were closed; all of these were aspirated several

cancellous bone, there being no communication with the joint cavity, which had been sealed off by adhesions.

Occasionally after a wound was sewn up pus continued to be formed. The collection of gram-negative pus was not often accompanied by redness of the skin, œdema, or tenderness, and very rarely by pain. It usually found its way to the surface between two stitches in the suture line. Only once was it necessary to open the joint by operation to evacuate a collection of pus.

FOREIGN BODIES

reason for this delay was to avoid operating through potentially infected tissue. A FB about the size of a marble was left in 4 cases, however, in the hope that it would remain quiet and give no trouble. In every instance it became necessary to remove the FB later, because it became a source either of sepsis or of irritation. In fact, the only patients who left hospital with a retained FB were those with a very small fragment situated well away from the working parts of the joint. Retained shell or mortar fragments were sometimes accompanied by a piece of clothing or grass, and unless this also was removed it was the cause of a subsequent sinus.

We had a warning of the risk entailed by leaving a foreign body near the joint. A patient admitted here in July had carried a shell fragment in the lower end of his femur since the last war. The knee had been normal until a few days before his admission, when he developed an acute suppurative arthritis which ended in ankylosis.

RESTORATION OF FUNCTION

An attempt to restore movement was made in all cases except those in which the bone damage was gross—i.e., in all but 8 of the 11 cases in the category of stiff knees. Active exercises, at first off-weight and later on-weight, were our mainstay in rehabilitation

After suture, plaster was applied from the upper thigh to above the ankle, leaving a large window over the front of the knee. Quadriceps exercises were begun at once, and when the patient could lift the limb off the bed and the knee was painless—usually at about ten days—the plaster was removed. Active off-weight exercises were then started. When a useful range and good power had been recovered—often in a further seven to ten days—the patient was allowed to walk; 50 patients were weight-bearing without splints within six weeks. Skin traction was used in a few cases in the early stages. We have come to no conclusion as to whether it is better than plaster.

In simple penetrating wounds where the joint filled with blood, the signs of synovial effusion were well-marked. Later, at the third or fourth week, in all but the slighter injuries, periarticular swelling was a common feature, being noted in 56 cases. Thus a boggy swollen knee, not hot or tender or painful, was often seen in the first eight weeks, and this appearance sometimes lasted three or four months. So long as the joint was painless, movements were encouraged and benefited the condition. In our early experience we were somewhat dismayed by the swelling, but it was gratifying to see how it eventually disappeared without apparently causing any permanent harm.

In some instances however the periarticular swelling was accompanied by heat, tenderness, and pain on movement—an irritated joint. Such a joint requires complete rest, and with rest it often quickly subsides. But in 5 cases, all of which had had a coliform infection, the condition persisted long enough for X-ray films to show a diminished joint space and some erosion at the edges of the articular cartilage—small pieces eaten out—indicating a definite arthritis.

Intra-articular adhesions were often troublesome and were the cause of a proportion of the bad results. These were naturally worst where the bone damage was greatest and where movement had been most delayed. On several occasions when exploring the joint we observed a dense layer of adhesions sprouting from a crack in the articular cartilage to the synovial membrane opposite. Sometimes these were the only adhesions in the joint, but when immobilisation had been maintained for more than a short time the suprapatellar pouch and the lateral recesses were in some cases almost obliterated.

In dealing with adhesions we found considerable use for controlled passive stretching. The patient lies on his face and the thigh is strapped to a table. From a sling round the ankle a cord passes upwards over a pulley to be attached to a weight. This weight is slightly greater than can be sustained by the quadriceps and it is used over an increasing period.

Manipulation under anæsthesia has a limited place in the treatment of these joints, but we sometimes used it with advantage when the range of movement ceased to improve with active exercises and passive stretching. When undertaken each manipulation should have a objective—it is a mistake to do too much. Manipulation is only justified when the joint is quiet and there are no signs of irritation. Otherwise it will be followed by so much reaction that it will do more harm than good.

Sometimes, when the adhesions were too dense for manipulation to break down, and there was a range of movement partially active and partially uncontrolled, open operation was carried out. The joint is opened and the adhesions are divided completely so as to allow a finger to be swept through the whole of the suprapatellar pouch and lateral recesses. Movements are begun immediately afterwards. We have used this expedient on a number of patients, only 3 of whom are in this series, and in every instance active control has been restored over the prev [illegible] and in some movement has steadily [illegible]

FLEXION CONTRACTURE

Six patients developed flexion contractures and this was a troublesome complication. It was usually due to a contracture of fibrous tissue consequent on damage to the posterior aspect of the joint. It was encouraging to see that it was often possible to overcome the contracture by traction for a fortnight. Sometimes this had to be repeated, and the wearing of a calliper for a short time was found useful. In 3 instances, where there was danger of posterior slipping of the tibia on the femur, vertical traction also was exerted through a Steinmann pin through the tibial tubercle.

The complications and delays in recovery are numerous; nevertheless, too gloomy a prognosis in the earlier stages was found to be unjustified, for it was often surprising how a knee that looked unpromising at three months became normal at six. It is a mistake to give up hope and rehabilitation, and to allow the patient to be transferred from an orthopædic centre to another hospital nearer the man's home, for valuable time may be wasted at a critical stage in the progress of his activities.

CAUSES OF FAILURE

Useful knees.—Table I gives a detailed analysis of those knees classified as only "useful," showing the cause of their shortcomings. These knees were painless, and no sepsis was present except where noted.

TABLE I—"USEFUL" KNEES

Case	Range	Months after wounding	Cause of failure
1	180°–90°	3	Extensive soft-part damage; anaerobic infection.
2	180°–90°	4	Sagittal through-and-through bullet wound of patella and femur.
3	180°–90°	3	Extensive laceration of quadriceps expansion; large punch fracture of condyle; *Bact coli* pus in joint.
4	180°–95°	3	Patella excised for gross comminution; skin loss.
5	180°–95°	5	Large soft-part wound; FB embedded in medial condyle; sinus.
6	180°–90°	5	Foreign body in patella; irritated joint, adhesions.
7	180°–120°	6	Groove in patella and front of condyles; adhesions and pain; needs patellectomy.
8	178°–92°	6	Piece of metal retained in cruciates for 4 months; had periarticular abscess with *Staph. aureus.*
9	178°–85°	6	Articular surface of external condyle damaged; fistula for a month till defect in capsule closed.
10	178°–135°	4	Laceration of whole of quadriceps expansion; patella removed; *Bact coli* pus in joint.
11	175°–120°	6	Comminuted T-shaped fracture of femur involving knee-joint.
12	180°–100°	6	Large groove in femur deep to patella; had sinus from soft tissue.
13	175°–135°	9	Intracondylar fracture; upward displacement of internal condyle; cancellous osteitis due to *B. proteus.*
14	180°–90	4	Intracondylar fracture; upward displacement of external condyle.
15	180°–110°	8	Gross bony damage to external condyle.

Stiff knees.—This category includes those with bony ankylosis or a short fibrous ankylosis giving a few degrees of movement only and that often painful. There were 11 in this category. In 8 there was gross shattering of the femoral or tibial condyles or both. In 3 there was destruction of the quadriceps mechanism with gram-negative sepsis which interfered with repair; 5 were infected with *Bact. coli*, 3 with *Bact. coli* and *B. proteus*, 1 w

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TABLE II—RELATION OF INITIAL DAMAGE TO RESULT

Initial damage	No. of cases	Normal knees	Useful knees	Stiff knees	Sinuses
Minor soft-part .. Minor bone ..	61	60	1	..	2
Major soft-part .. Minor bone ..	15	10	4	1	4
Minor soft-part .. Major bone ..	9	4	5	..	1
Major soft-part .. Major bone ..	16	1	5	10	9

grooves not or only slightly involving the articular surfaces of the joint have been classified as minor bone damage. It is probable that some cases with major bone damage who now have a normal function may deteriorate after a few years.

Only 1 of the 60 minor wounds became seriously infected—that is, to such an extent as to impair function. Sepsis due to penicillin-insensitive organisms was a factor in the loss of function in some cases, and it appears that the more extensive the damage the greater was the incidence of sepsis and the more difficult it was to eliminate. However, we estimate that only 10 cases, on account of sepsis, had worse results than would be expected from the structural damage alone. Indeed the ultimate result seems usually to be in direct proportion to the structural damage.

CONCLUSION

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said in his account of this injury in 1917, the coliforms may be regarded as comparatively harmless, they are

ublesome microbes.
y less frequent than
but much less severe
due to gram-negative
organisms, is more subdued. The picture resembles that of a subacute infective or proliferative arthritis. A can-

knee-joint wounds depends on the discovery of a means of eliminating *Bact. coli* and *B. proteus*.

We should like to thank Lady Florey for her instruction in the use of penicillin; and Mr. D. Freebody for the records of 8 cases.

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ORDER AND DISORDER IN THE LARGE INTESTINE

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II. COLON NEUROSIS AND ULCERATIVE COLITIS*

THERE are two disorders of the colon, one a disturbance or disturbances of function only, best known as colon neurosis, the other an organic disease, or possibly

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that part of medicine which is concerned with an appraisal of both the emotional and the physical mechanisms involved in the disease processes of the individual patient, with particular emphasis on the influence that these two factors exert on each other and on the individual as a whole. Halliday (1943) has defined it more simply as concerned with bodily disorders whose nature can be appreciated only when emotional disturbances are investigated in addition to physical disturbances. There is, of course, nothing new in this emphasis on a body-mind relationship in disease, though there has been some tendency of late to pay it lip service only. The wholeness of the individual

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manent addition to medical nomenclature, but rather a temporary expedient giving a new direction to medical thought.

Within the terms of his definition Halliday (1943) includes a number of diverse disorders differing in ætiology, course, and pathology but with a common form, which embodies fundamental characteristics—the importance of emotion as a precipitating factor, a particular type of personality associated with each particular affection, a pronounced disproportion in sex ratio, the occurrence either simultaneously or in alternation of other psychosomatic disorders, a well-marked familial incidence of the same or an associated disorder, and finally a phasic manifestation of the illness. Among these disorders he includes essential hypertension, effort syndrome, Graves's disease, duodenal ulcer, mucous colic, and certain types of constipation. In a similar sense Moschowitz (1943) speaks of the hyperkinetic diseases, maladies largely conditioned by psychosomatic factors, the result of the impact of environmental influence upon a constitutional background.

In these disorders there is a primary exaggeration of normal function which may end in structural change; order proceeds to disorder, disorder to disease. By following this process, instead of the usual method of tracing cause from a study of materies morbi, we proceed from cause to effect; we watch, as it were, the crime committed. It is today the method of greater promise. I propose to examine certain aspects, chiefly ætiological, of colon neurosis and ulcerative colitis in the light of this orientation, relying chiefly, though *not* wholly, on my personal experience.

Colon Neurosis

In 1881 and again in 1930 distinguished Fellows have lectured before the College on the visceral neuroses, and Ryle (1930) has defined them as disorders of visceral movement, secretion, and sensation which occur in the absence of organic disease. The term, neurosis, in this connexion is not wholly satisfactory, since it is too often regarded as synonymous with psychoneurosis, and though the association is frequent it is not invariable and may not be fundamental. Confusion has been added by the use of a number of terms intended to define colon neurosis more precisely. The passage of mucus in casts or otherwise, the occurrence of colic, of

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* The Croonian lectures for 1944, delivered at the Royal College of Physicians of London. Lecture I appeared last week.

unstable colon, dyskinesia, dyssynergia, and hyperkinesia of the colon—a very babel of terminology. Particularly undesirable is the retention of the term mucous colitis, or mucomembranous colitis, for, as Hurst has often pointed out, evidence of colitis is very rare, and in its modern equivalent the passage of mucus infrequent and of casts exceptional. In a consecutive series of 218 cases of colon neurosis mucus was passed occasionally in 26 only, and in the form of casts in 6, and I doubt if any could be regarded as examples of colitis within the proper meaning of the term.

Mucous colitis, or more properly mucomembranous colic, is a period piece in medical history, a relic of the late Victorian and Edwardian epochs, a common disorder until 1914 when it disappeared with remarkable suddenness and completeness. It was an example of exaggerated and incoordinated motor activity and excessive secretion of mucus in response to emotional stress, a specific reaction to the environment of its time in certain constitutions. It differed from the typical colon disorder of today by its almost invariable occurrence in the female sex, by the greater intensity of abdominal pain, by the passage of large quantities of mucus, often in casts, by the very large quantities of purgative medicine taken to open the bowels, and by the profounder emotional upset which usually dominated the picture—in short, by the greater functional disturbance and more obvious manifestation of objective phenomena. Its disappearance in 1914, despite the fact that colon disorders are as common as ever, has not been satisfactorily explained; the more purposeful life for women which resulted from the Suffragette movement and the careers made available by the 1914–18 war may have had something to do with this very desirable result. It is interesting to recall that Da Costa, who was one of the earliest writers to give a full account of mucous colic under the title membranous enteritis, published in the same year, 1871, his observations on the irritable heart in soldiers, and while he recognised the importance of nervous manifestations, especially the hysterical reactions and hypochondriasis, in the enteritis, he evidently had not appreciated their significance in the soldier's heart.

INCIDENCE AND DISTRIBUTION

Hawkins (1906) pointed out that the colon neuroses become rarer as we descend the social scale, and they are certainly uncommon in hospital practice. White, Cobb, and Jones (1939) with difficulty collected 60 cases from the outpatient department of the Massachusetts General Hospital in a period of eighteen months. In an earlier paper (1934) I reported that in a four-year period 1078 patients were admitted to the wards of the General Hospital, Birmingham, for chronic disease of the digestive system, and of these 85, or 8%, were admitted under the various diagnoses which come within the group of colon neurosis. The proportions recorded by Spriggs (1931) and Jordan (1929) in their special clinics are much higher and amount to 20–30% of the total. My own records over fifteen years show that out of some 3400 examples of abdominal disease almost exactly a quarter were due to colon dysfunction, while of these colon spasm accounted for 413, a figure almost identical with that for duodenal ulcer, the only lesion with comparable frequency over the same period. For my present purpose I have analysed 375 consecutive cases, formed of a group of 157 reported on earlier and 218 seen more recently.

The 375 patients consisted of 141 men and 234 women; 72% of the total were between the ages of 20 and 50 at the time of onset, a similar distribution to that found by Jordan (1932), who analysed 1000 cases of colon instability. Among the 218 patients in my later series, 73 men and 145 women, the occupations of 120 are known, the remainder being married women without other employment. They fall almost wholly within the professional and black-coated worker classes of the community. Among them are 25 office workers, of whom 12 held responsible secretarial posts, and the teaching, nursing, and medical professions are well represented. In the whole series there are only 8 manual workers, although in an industrial area these have formed a substantial proportion of the private practice from which these records were taken. White, Cobb, and Jones (1939) noted the rarity of the syndrome among those in hard manual labour and its frequency among sedentary workers, and deduced from this that softness or lack of condition was a factor to be recognised.

It is at least as noteworthy, and probably more significant, that these disorders fall especially heavily on classes who contribute more than the average to the daily life of the community; classes who have, on the whole, a harder struggle than most to maintain their high standards of living, and at an age when the responsibilities and anxieties of livelihood and parenthood are most likely to be felt. A similar association was noted by Ryle (1932) in another psychosomatic illness—duodenal ulcer. The environment is often difficult and at times hostile to a satisfactory life for these folk, and though the determining factor may lie in constitutional defect, the social background must be well considered in any wide survey of ætiological factors.

ÆTIOLOGY†

The ætiological factors in colon neurosis, as in all visceral neuroses, are multiple, variable, and often infinitely complex, but in every case some attempt must be made to assess the importance of the various mechanisms which may be operative, such as irritability of the neuromuscular mechanism conditioned by local disease, by local irritation from unsuitable food or an irritating purge; reflex disturbance of function from other organs, (e.g., the pelvic viscera, the appendix, the gall-bladder, and the anal margin); humoral mechanisms such as allergy and the results of endocrine imbalance; and various stimuli of psychogenic origin, particularly those which result from long-continued anxiety. In any given group of patients the emphasis on one or other of these mechanisms will vary. It will vary, too, with the bias of the observer, for few can remain strictly impartial when the evidence is so conflicting.

Organic diseases of the colon itself which of necessity disturb function are excluded from consideration here, but certain late results which follow dysentery and nonspecific inflammations seem to be due to a residual irritability of the neuromuscular mechanism and appear clinically as periodic attacks of diarrhœa often alternating with constipation. Among my 218 cases, 17 were regarded as postinfective and as examples of neurosis conditioned by local factors.

BOWEL HABITS AND PURGATION

The bowel function in these patients is so often determined by their purgative habits that they cannot well be considered apart. Constipation, past or present, real or alleged, was complained of by 196 of 375 patients, diarrhœa by 61, with alternations of these by 59, while 59 had normal bowel movements. There is no doubt that in the great majority constipation exists only in the patient's mind and has been treated by purgatives for so long that few of them can recall a time when the bowels moved without assistance. A barium meal usually demonstrates a perfectly normal passage through the intestine; in 85 barium meals stasis was reported only 6 times.

In no disorder is purgation so rampant or ill judged. Out of the 375 patients, 186 were taking irritant aperients nightly, the favourites being cascara, phenolphthalein, and senna. These figures, though significant enough, are less than those recorded by Spriggs (1931) who found that 471 of 764 patients who complained of constipation were taking a daily aperient, while Jordan (1929) in her investigation of 1000 cases of unstable colon records an incidence of 80%. I very much doubt however if purgatives, or constipation, or both are anything more than factors perpetuating overaction in an unstable colon. Many patients have always known that purgatives upset them. They dread using them and are comfortable only when they are constipated. Unhappily they do not realise that their socalled constipation is the result of colon inactivity following a purge, and the habit continues. The result is a weakening of the autonomic function of the bowel and the development of increasing instability.

Many varieties of stools are passed in colon neurosis—normal stools, loose stools with mucus, hard

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† Symptomatology is not considered in this lecture; Hawkins (1906), Dawson (1921), Hutchison (1923), and Ryle (1928) have contributed memorable clinical descriptions of the disorder.

[illegible] mucus, ribbon and pencil- [illegible] tone of the anal sphincter. [illegible] that mucus was passed at some time or other by 26 patients, 6 of whom occasionally passed blood. Sigmoidoscopy, which was carried out in 16 of them, showed a normal appearance in 13, and in 3 some evidence of hyperactivity such as increased vascularity, redundancy of folds, and excess of mucus.

REFLEX DISTURBANCES AND HUMORAL MECHANISMS

Reflex disturbances of colon function from other viscera—appendix, gall-bladder, or pelvic organs—are often cited as ætiological factors, but with the possible exception of pelvic disease and displacements I have become chary of attributing much importance to them. Out of 218 patients, 42, or one in five, had had some form of abdominal operation: appendicectomy in 28 (a few on my advice), cholecystectomy in 2, cæcoplication in 1, nephropexy in 1, and various gynæcological procedures in 10, all without permanent benefit; while 2 patients in this series had appendicectomy for acute attacks without influence on the colon dysfunction. Admittedly differential diagnosis is difficult and drawing a bow at a venture occasionally justifiable. Nevertheless an abdominal scar, especially in the right lower quadrant, may be evidence of colon disorder. It will be recalled that a well-scarred abdomen was a feature of Hutchison's (1923) memorable description of the chronic abdominal invalid.

Rectal examination reveals in some cases spastic contraction of the sphincter ani, which may be part of a general colon hypertonicity or the result of some irritative lesion. Great importance should be attached to painful lesions of the anal margin, not only as interfering with defæcation but as responsible for a small group of cases of colon neurosis. I have notes of 14 cases, in 5 of which the sphincter was abnormally tight and tender to [illegible] which there was a demonstrable [illegible] no doubt, are secondary to con- [illegible] three or four histories in which painful defæcation led to the taking of aperients and the establishment of colon overaction and abdominal pain, associated in one elderly lady [illegible] casts, and in another with [illegible] leading to loss of appetite [illegible] In each case barium enema [illegible] normal, and cure was ultimately brought about by suitable treatment of the anal condition. Howship (1830) had recognised this association in his original [illegible] dic stricture of the colon. [illegible] mation of the anus and anal [illegible] with the proctoscope cannot be exaggerated.

Humoral mechanisms play their part in ætiology, and the effect of thyrotoxicosis in causing increased colon activity is well known. Graves's disease was noted in the personal history of 6 of my patients, and partial thyroidectomy had been successfully carried out in 4. The disease was quiescent in all, and had antedated the colon symptoms by some years in 3, while in the others the two had run concurrently for a time. True abdominal allergy is rare but should come to mind in the differential diagnosis of acute attacks of colon spasm. Mucus is usually passed in the stools and there may be eosinophilia. I have only one case-record of this type of event.

It is well known [illegible] and tobacco was [illegible] patients, and in o[illegible] especially coarse [illegible] factors, and cold winds in some instances.

EMOTIONAL AND TEMPERAMENTAL CONSIDERATIONS

Psychological episodes provide the largest group of conditioning and the determining factors in my series, and I noted some form of nervous instability in 135 out of 218 patients. Anxieties of one kind or another made up the great majority of these, fear of malignant disease or of appendicitis, perhaps the commonest cause of consultation, with many and varied anxieties chiefly of domestic origin.

It is unlikely that the various exciting factors would act adversely on a bowel mechanism that was stable, and there is some evidence that a predisposition to instability may be inherited—not one specific for the colon, for of that we have no evidence, but a constitutional tendency to over-action of plain muscle such as is seen in asthma, essential hypertension, Graves's disease and peptic ulcer, all psychosomatic disorders which are noted too frequently in the family and personal histories of colon neurosis to be coincidental.

I do not think that any special type or temperament can be recognised. The great majority of patients were noted as being spare. There is often, too, a nervous tension which shows itself in heightened reflex activity and a general restlessness and urge reminiscent of the ulcer patient; and, as mentioned, the two disorders are not infrequently associated. White, Cobb, and Jones (1939) lay little stress on the build of the patient and more on the general muscular condition, pointing out as I have already noted that the disorder is much commoner among sedentary workers than those doing hard manual labour. I am inclined to think however that it is the social environment from which these patients come rather than their physical condition which determines the appropriate stresses.

Colon neurosis is a symptom complex with protean manifestations, presenting almost as many subjective and objective pictures as there are sufferers. Common [illegible] in psychoneurotic [illegible] point of extinction, [illegible] n, with or without distension, reflex dyspepsia, and irregularity, inadequacy, and uncertainty of defæcation. These somatic evidences of disturbed colon physiology need emphasis since it has [illegible] d pre- [illegible] sycho- [illegible] es by [illegible] on, to [illegible] to an [illegible] Larri- [illegible] us is certainly not essential for diagnosis.

Stacey Wilson (1927) and Evans (1929b) have also usefully pointed out that patients with colon neurosis often show surprising improvement, both mentally and physically, when the condition is regarded and treated as a peripheral disorder of the neuromuscular mechanism and independent of any other nervous disturbance that the patient may present. Indeed, in my experience very few patients require anything more in the way of psychological treatment than can be given by a general physician in the course of consultation.

Ulcerative Colitis

Ulcerative colitis, or colitis gravis, is a disease, or perhaps a group of lesions, which has been traced back as far as 1669 when Sydenham described the bloody flux, though I feel that we cannot exclude as an earlier case the woman with an issue of blood twelve years, especially in view of her unfortunate experiences at the hands of many physicians. Hale-White (1888) separated ulcerative colitis from bacillary dysentery, and although this position has been challenged by many subsequent writers, who have regarded it as a sporadic and chronic form of dysentery, modern opinion supports the views of Hale-White and later Hawkins (1909) in regarding the two disorders as alike only in their pathological end-results. Recent views on ulcerative colitis are reflected in qualifying adjectives such as bacterial, allergic, or psychogenic, descriptive more of the bias of their authors than of any real progress in the understanding of the disease.

It is a grave disorder with a high mortality-rate, affecting principally young people in the formative and creative years of life, and often those with intelligence above the average. It runs a long course with a pronounced tendency to relapse, and, despite much patient investigation and the accumulation of knowledge of various aspects of the illness, remains obscure in its ætiology, uncertain in its course, and fickle in its response to treatment.

INCIDENCE, ONSET, AND MORTALITY

The true incidence of ulcerative colitis is difficult to obtain. A changing terminology and an uncertainty as to classification render hospital statistics unreliable, and in spite of much search I have been unable to determine the true rate of hospital admissions and to substantiate or refute a strong impression I had gained that the disease was on the increase. For similar reasons the Registrar-General's returns, which at present include ulcerative colitis under one of two headings, colitis and ulceration of the intestine, do not furnish reliable figures as to the death-rate. No large series of cases has been studied in this country and is probably not available, and most writers such as Hawkins (1909), Hurst (1935b), Tidy (1930), Hearn (1931), Spriggs (1934), and Cullinan (1939) have confined themselves to a careful study of one or more aspects of the disease in a small group of patients.

In 1933 Bulmer and I published a survey of 95 cases admitted to the Birmingham General Hospital between 1920 and 1932. Between then and the end of 1943 a further 182 cases have been admitted. The present analysis has reference partly to the entire series of 277, but more particularly to the later group of 182. Blood, mucus, and pus were present in the stools at some time in all the cases; the diagnosis was confirmed by sigmoidoscopy in the great majority and by barium meal or barium enema in a large number. The disorganisation of hospital records by enemy action and the shift of the population during the war has prevented any further follow-up of the original series and only a limited one of the more recent cases. Of the total number of 277, the age at onset was under 40 years in 215, or 77%, 151 being under 30 years, and 41 under the age of 20. The youngest was a girl of 11 years, and the oldest a man of 70, who has recently been under my care for a relapse at the age of 72. In the whole series there were 164 females and 113 males.

In 231 cases where the type of onset was known, it was insidious in 128, sudden in 97, and acutely fulminating in 6. A sudden onset refers to the abrupt appearance of some symptom such as diarrhœa or hæmorrhage from the bowel without other acute manifestations. A simple diarrhœa is often the first symptom, as was noted by Hawkins (1909), with the appearance of blood, pus, and mucus later; sometimes blood will be passed at the onset, occasionally as a frank hæmorrhage, more often with loose stools. Pain as an early symptom was exceptional.

The death-rate was high even with the limited follow-up which was possible. Bulmer and I (1933) reported that of our 95 cases reviewed 31 had died. It has been impossible to follow this series up further. Buzzard, Richardson, and Turner (1938) recorded a mortality of 30·2% in 116 patients at St. Thomas's Hospital, and this included a follow-up of 2–12 years. Of 182 patients seen over the past ten years, a recent inquiry has provided information in 111, of whom 37 have already died of the disease, 9 are considered to have recovered completely, 54 to be improved, and 11 unchanged. There is thus a death-rate over the whole series of 25% with 64 unaccounted for in the previous group and 70 in the present one. I see little tendency to improvement in these figures in recent years in spite of such useful additions to treatment as massive blood-transfusion and the sulphonamides. Of 66 patients admitted to the Birmingham United Hospital for ulcerative colitis during the years 1941, 1942, and 1943 16 are now dead.

PERSONAL AND FAMILY HISTORY

There seem to be no predisposing factors in this disease, which usually appears from a clear sky. Spriggs (1934), however, states that in his experience ulcerative colitis occurs usually in those who were unhealthy from some other cause. In my cases there was little evidence of any previous disorder, constitutional or otherwise, in spite of the often fragile appearance many of these patients presented. A consecutive series of 95 well-attested histories showed that in 75 there had been no previous history of ill health, and that in 81 the family history was unexceptionable.

Allergy, to which great importance is attached by some American authorities, was inconspicuous. Asthma was a feature of 2 personal and 3 family histories, one patient suffered from angioneurotic œdema and one from allergic eczema. Migraine was met with only 3 times, and not at all in the family histories. Mucous colic was an antecedent in one young man, and was a family feature in 2 instances. Ulcerative colitis occurred in a sister of each of 2 patients, and in 2 sisters of a third. I have found no evidence to suggest that there is a hereditary tendency in this disease, but Lockhart-Mummery (1934) has met with several cases where the condition has been present in successive generations and believes that heredity has a great deal to do with its incidence. Catarrhal and other infections did not predispose to the colitis in my cases.

Pregnancy seemed to be a factor in 3 patients, but its influence varied. In one patient the disease set in shortly after the birth of her first child, and a relapse occurred during the puerperium of her second. In another, each of 5 pregnancies was associated with an attack of ulcerative colitis, which cleared up rapidly after normal confinements. In a third pregnancy aggravated the disease, and again the confinement was followed by rapid improvement. In neither patient did the condition call for the termination of the pregnancy, since it responded satisfactorily to treatment.

BOWEL HABITS

In 92 patients in whom the previous bowel habits were recorded, 55 had had regular and normal actions before the onset of the disease, 20 had suffered from constipation, and 17 from looseness with occasional frequency. It has been my impression that when mucus, blood, and pus are associated with the passage of constipated stools, the disease is usually limited to the rectosigmoid area, is generally unattended by toxic manifestations, and, though very resistant to treatment, carries a much better prognosis than the far greater number in which the colon is involved and diarrhœa invariable. At the same time, I agree with Cullinan (1938) that no useful classification can be based on a regional distribution of the lesions. As he points out, not only are all gradations of the one disease process seen in different patients, but often the type appears to change in an individual patient.

I recall one such example in a girl of 16, who had been admitted to a nursing-home under a surgical colleague for rectal bleeding thought to be due to hæmorrhoids and associated with severe constipation. [illegible] intense hæmorrhagic proctitis wh[illegible] below the pelvirectal bend, but in spite of careful treatment and long rest in bed periodical sigmoidoscopy showed the disease gradually ascending the colon till it had passed beyond the limits of vision. At no time were constitutional changes well-marked and after many months in bed she made a complete recovery. After a lapse of eight years of normal health, she came under my care again last year for a recurrence of the proctitis, the result of neglecting her bowels when serving in the WAAF.

ÆTIOLOGY

Ulcerative colitis is the bacteriologist's bugbear. The routine examination of many thousands of specimens of stools or material obtained direct from the ulcerated surface has failed to identify any specific organism. Very occasionally a pathogen of the typhoid-paratyphoid-dysentery group is isolated to justify a monotonous and usually unremunerative procedure. More commonly an excess of enterococci and beta-hæmolytic streptococci are grown, but none has yet been shown to have other than secondary significance. We know little or nothing of the cause or causes of non-specific ulcerative colitis, though we recognise the part played by secondary invaders and much more rarely the evidence of vitamin deficiency.

Such a situation demands a revision of our views of this grave malady and justifies a different approach. As Ryle (1932) has aptly said in referring to duodenal ulcer: "Preoccupied with the lesion and with hypotheses as to its mode of initiation and perpetuation by local bacterial and chemical action, we have too long delayed our study of the soil in which it thrives." Confronted by grave illness and irreversible structural change, we have not fully realised that we are observing the end-results of a process with its seeds often in the distant past, for ulcerative colitis is a disease which has an existence in time as well as space. There is an incompleteness and a lack of balance in our present wholly clinical approach to this and many other disorders which can only be satisfied by a fuller inquiry into origins.

RÔLE OF ALLERGY

There is a growing body of opinion, in America rather than in this country, that hypersensitiveness to certain foods, notably milk, plays an important part in determining the colonic reactions in ulcerative colitis. Andresen (1925) included ulcerative colitis among the allergic [illegible]

14 cases treated by diets which eliminated certain foodstuffs; 7 obtained complete and maintained relief from their symptoms, 3 obtained partial relief, and 4 showed no improvement. In 8 of the cases brought under control the specific foods reproduced the diarrhœa. He concludes that chronic ulcerative colitis in all its stages may be caused primarily by allergy and secondarily by superimposed infection and the effects of resultant avitaminosis.

Mackie (1942) regards food allergy as of fundamental [illegible] and maintenance of activity [illegible] s not regard it as of primary [illegible] of 200 patients he obtained symptomatic and proctoscopic evidence of an allergic factor in 60%. He pointed out that the probability of getting evidence of allergy varied enormously with the phase of the disease of those yielding such evidence—from 70% during maximum a[illegible] to 2% in the state of quiescence Such var[illegible]s, of course, in keeping with the known fa[illegible] of [illegible]ergic responses.

I am not aware that any writer in this country has laid particular stress on this aspect of ulcerative colitis. We have required, I think, stricter evidence before accepting a given reaction as truly allergic. The abdominal symptoms usually attributed to food allergy are paroxysmal in appearance and sudden in onset. Pain of sufficient severity to imitate an acute emergency may occur, with or without vomiting; diarrhœa with mucus, sometimes in the form of casts, may be present. In some cases pain is absent and the reaction is represented by diarrhœa and vomiting. Eosinophilia may occasionally be found in the mucous discharges and a slight eosinophilia in the blood. A personal and familial [illegible] fever, urticaria, and migraine [illegible] well-known postulates may [illegible] of the criteria of an allergic reaction accepted in this country.

In a series of 121 patients there were no acute episodes nor crises, no attacks of spasm of plain muscle such as are characteristic of allergic reactions. Eosinophilia has not been found either in the blood or mucous discharges in large numbers of carefully observed patients, and no significant number have shown allergic phenomena either in their family or personal histories. In a special inquiry in 50 patients as to the precipitating factor of their illness, only 7 associated it with food, and in only one instance was a specific food—fruit—mentioned.

Eliminating diets are troublesome to prepare and irksome to take, and the results difficult to assess unless there are exceptional facilities for careful observation and prolonged control.

An attempt was made to treat 15 patients with moderately severe attacks during the acute phase by means of Andresen's allergy test diet, consisting of the five foods—milk, eggs, wheat, potato, and oranges or tomatoes—which experience has shown are most likely to promote reactions. The diet, which is similar though more restricted to the ordinary low residue diet, was usually given to these patients in its complete form for five days. Thereafter one food was eliminated at a time for a similar period of observation. Results were noted in terms of subjective symptoms, the number of stools, and proctoscopic appearances. Three of the 15 were undoubtedly improved both subjectively and by a well marked and rapid lessening of the number of stools when on a milk free diet. Diarrhœa started when it was reintroduced. There was no comparable improvement of the bowel to be noted on sigmoidoscopy. There was no reason to suspect any failure to digest milk in any of these patients. There were no curds in the stools, small intestine function being usually normal in ulcerative colitis, nor was there any association between those who appeared sensitive to milk and achlorhydria. In the remaining 12 there were no favourable or unfavourable reactions.

From my own short experience I am not convinced that allergy plays anything but a very small part in the ætiology or life history of ulcerative colitis as we see it, The vagaries of the bowels in these labile personalities are notorious. An unfortunate ward episode, a letter from home, a visitor, a chat with a neighbour, a misunderstanding with nurse or doctor, may each be sufficient to upset a nicely balanced experiment. On the other hand, the disease has a natural tendency to improve under a hospital regime. Very careful observation and control, not at present easily attainable in many hospitals, is necessary before we can put these important observations to a further test.

EMOTIONAL FEATURES

While recognising the probability of multiple ætiological factors, [illegible] components of [illegible] study essential [illegible] the disorder an[illegible] some years occasional papers have been published, mainly by psychiatrists (Murray 1930, Sullivan 1935, Wittkower 1938, Daniels 1942), on the emotional aspects of ulcerative colitis, and testimony has slowly accumulated to suggest that it is a psychosomatic disorder. For the most part general physicians who have written about the disease have made little or no reference to this aspect. Spriggs (1934) recognised the considerable nervous accompaniments of the disease, the patients [illegible] able anxiety and hard work.

Cullinan (1938) was the first physician in this country, so far as I know, to lay special emphasis on an unusual and abnormal personality and on the superimposed emotional disturbance which frequently preceded the onset. Forty selected cases of his were examined by Wittkower (1938), who came to the conclusion that ulcerative colitis was a disease of the mentally ill or maladjusted, almost all his series showing character [illegible] psychoses. In most of the [illegible] l abnormalities far beyond [illegible] ences in the average population were found to antedate the initial onset of the colitis.

The most striking feature of these patients, as I see them, certainly of a majority of them, is their immaturity, sometimes in feature and physique, more frequently in their outlook on life. Often they look younger than their age and are liable to be childish in speech and manner and emotionally unstable. Many appear to be dependent, feeble pers[illegible] their environment ar[illegible] one or other pare[illegible] natures are common; [illegible] to the point of fussiness are frequent traits. They approach with anxiety and assume with trepidation the [illegible] marriage [illegible] justments [illegible] st to the [illegible] less ulcer [illegible] must be [illegible] verage a[illegible]

It is impossible to establish from a study of hospital records the frequency with which emotional events have played a part in initiating, perpetuating, or aggravating a colitis—our awareness of the importance of this factor and detailed studies of the social background are of too recent date—but of 68 patients followed up recently a superficial inquiry suggested that in at least 40 emotional stresses played a substantial part, protracted anxiety being a dominant factor, more particularly perhaps in respect of exacerbation in a colon already conditioned to overaction by local disease.

During 1943 I referred a dozen patients, 4 men and 8 women, admitted to my wards with ulcerative colitis, to the psychiatrist, Dr. May Pearce. There was no selection and the patients were taken in order as they were admitted to my care and after the diagnosis had been finally established. The youngest was 17 and the oldest 49. The following account is abstracted from her report.

All but one of these patients described themselves as "worriers" and in one way or another as "sensitive." Emotional instability in one or other parent was reported by 7. The fussy, over-anxious mother loomed large in the histories and seemed to be of particular emotional significance, a source of conflict and difficulty. Of the 12 patients, only one seemed to be a really well-adjusted personality. At least 7 showed definite psychoneurotic symptoms, psychoneurotic traits, or social maladjustment. Two women were backward in intelligence and had broken down in health and spirit, in sheer inability to cope with adult life and responsibility; one of these developed colitis in each of five unwanted pregnancies, the other on being urged to marry. Real intellectual difficulty is uncommon in colitis patients; the majority are of average or more than average intelligence, but varying degrees of emotional and psychosexual immaturity, feelings of inadequacy and of inferiority, childish dependence on home and family, are characteristic traits in many of them. Obsessional traits, over-conscientiousness, and a morbid fear of failure are common; well-marked phobias were described by 3 women, and in 2 of these an attack of colitis followed immediately on the experience of the dreaded situation. In most cases the onset and the return of symptoms were associated with emotional disturbance; 5 patients spontaneously admitted the association, and 2 others readily acknowledged a coincidence of emotional stress and the onset of symptoms, which they had not previously noticed. Sometimes dramatic events preceded the illness—an unwanted pregnancy, leaving a familiar home, disappointment at work, to mention a few. More often it was some increase of emotional stress or frustration, or an apparently insoluble difficulty. Few of these events were drastic enough to produce incapacity in a normal well-adjusted personality, but they were of especial significance to each of these individuals' life situation.

These patients did not conform to any one psychoneurotic pattern in character or symptoms, but were on the whole the familiar material of the psychiatrist's consulting-room. The coincidence of emotional disturbance and the onset of the disease was sufficiently clear to suggest that psychological events and psychological maladjustments were important factors in the genesis of symptoms.

PSYCHOLOGICAL APPROACH IN TREATMENT

Good results from psychotherapy have been reported in early cases by Murray (1930), Sullivan (1935), Daniels (1942) and Moschowitz (1943), particularly in preventing relapses, and though it is obvious that its use in ulcerative colitis will be limited it deserves further exploitation. A psychological assessment in all early cases would seem to be a useful contribution to ætiology as well as to treatment. At the moment these studies have their chief value in establishing the type of individual, if such there be, and drawing attention to the environment in which the disease starts, to the domestic, economic, and industrial influences, any one of which may be a precipitating factor. This is the field of social medicine, the natural development of medical science in a modern community. It is largely untilled ground, and in these psychosomatic disorders we have much to learn from it and perhaps also much to unlearn. It will add completeness to our present almost wholly clinical and laboratory approach and offer that wider prospect of the disease which at present we lack. Along these lines, too, there may emerge a means of protection for the inadequate and poorly equipped personality and perhaps a direction to a way of life most suited to its limitations.

Ulcerative colitis is not a common disease, nor is it rare. It does not present the wastage and the economic problem of peptic ulcer, but it is a disease of greater gravity and takes a heavy toll of many young and useful lives and incapacitates more. A long and continuously depressing experience has convinced me that a fresh attack on the problem from an entirely different angle is long overdue.

Disorder and Disease

Colon neurosis and ulcerative colitis are respectively the ultimate expression of disorder and disease as we see it in the colon, but there is no evidence whatever for regarding them as successive stages in the development of one disease process. Colon neurosis begins and ends as a neurosis and it is quite exceptional to find evidence of inflammation in the stools or through the sigmoidoscope. Ulcerative colitis is a disease, sui generis, and develops along its own special lines. Only rarely is a previous history of colon disorder obtained. There are, however, certain resemblances between the two disorders. In both the functions of the bowel are exaggerated; only in one are there superadded the exudative manifestations of inflammatory disease. Psychological events are prominent in the history of each, and there is a close association between emotional episodes and bowel upset; but I have not recognised any special type of individual in colon neurosis, at least not so consistently as the immature personality in which the graver disorder seems to thrive. Age-incidence may have something to do with this condition, for colon neurosis tends to fall about a decade later. Other psychosomatic disorders, such as asthma, peptic ulcer, and Graves's disease, are wont to be associated with colon neurosis but not with ulcerative colitis.

When we come to consider the mechanisms that determine the ultimate tissue reaction we are on difficult ground. It would seem from the experiments of Florey (1938) that the sacral autonomic system is the final common pathway whereby many extrinsic and intrinsic factors are translated into increased or abnormal activity, in the one case keeping within the borders of the normal pattern, and in the other uncontrolled, passing from disorder to disease with exudation, tissue necrosis, and secondary invasion. That such a process can occur has been revealed in the work of Wolf and Wolff (1942) on peptic ulcer.

One can even recognise resemblances between peptic ulcer, especially duodenal ulcer, and ulcerative colitis. The ingravescent onset with dyspepsia in the one and diarrhœa in the other, the tendency for periods of quiescence to alternate with periods of activity and for these to be dependent on emotional influences, and the ultimate establishment of structural disease in both. We can recognise, too, similar milestones in the progress of each, more pronounced in the commoner and better known disease, yet discernible in the other—a period of environmental stress acting on a predisposed or ultimately producing a sensitive constitution; a period of intermittent exaggeration of function; a period when the abnormal function has become the conditioned and inevitable response to certain stimuli; and finally a period of irreversible structural change. The studies of Hurst (1929), Ryle (1932), and Davies and Wilson (1937) have taught us much of the natural history of peptic ulcer and the value of the extended perspective. I suggest that in the origins and mode of development of ulcerative colitis there is a promising field of inquiry.

Conclusion

In these lectures I have tried to illustrate the general principle that certain disorders and diseases, which for the present we speak of as psychosomatic, have their origins not in any extraneous agency but in a perversion of normal function, and to suggest as a corollary that for inquiry to be fruitful and treatment effective the evolution of events—order, disorder, disease—must be fully appreciated.

The history of medical progress shows that advance is uneven, periods of great activity being punctuated by periods of stagnation during which ground won is consolidated. We are now at the end of a period which has been dominated by the ancillary sciences, notably radiology and biochemistry, and during which the individuality of the patient has suffered some eclipse. There is evidence now of a new sense of direction: to study man not only in sickness but in health, in his home as well as in hospital; to see at first hand those social, financial, and industrial impacts which are his daily lot; to learn their influence in the initiation, aggravation, and perpetuation of disease, and perchance so to control them that order shall not proceed to disorder, nor disorder to disease.

To my colleagues on the staff of the Birmingham United Hospital I am indebted for the generous loan of these case-records. I am especially grateful to Mr. Ronald St. Johnston and Dr. John Malins for their help in the follow-up of cases.

References at foot of opposite page

EFFECT OF PENICILLIN ON CULTURES IN LIQUID AND SOLID MEDIA *

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Fleming (1929) observed that crude penicillin, besides being bacteriostatic, was also bacteriolytic and bactericidal for sensitive organisms. The Oxford workers (Abraham et al. 1941), however, regarded its action as mainly bacteriostatic. More recently its bactericidal action has been re-emphasised (Hobby et al. 1942, Bigger 1944a and b, Rantz and Kirby 1944, Todd 1945, Garrod 1945, and others), while Rantz and Kirby (1944) and Todd (1945) have shown that lysis is an important feature in its action.

The work here described was done in an attempt to throw light on the fundamental nature of penicillin inhibition, by defining more precisely its effect at different stages in the growth cycle. The experiments, which were made with both liquid and solid media, had been completed when Todd showed that lysis was a regular feature in the action of penicillin on sensitive organisms, that it was dependent on the growth phase, and that it occurred most rapidly with organisms growing at maximal speed. My results with liquid media are mainly in agreement with those of Todd, though different methods were used and I have been unable so far to obtain definite proof of lytic action of penicillin on hæmolytic streptococci. The results with solid media help to explain some puzzling features of penicillin inhibition in the agar diffusion method.

EXPERIMENTS WITH LIQUID MEDIA

Methods.—18 hr.-old broth or 5% horse-serum broth cultures of the Oxford staphylococcus and of freshly isolated strains of staphylococcus, *Streptococcus pyogenes*, pneumococcus, and meningococcus were used. Series of tubes containing 5 c.cm. of broth or serum broth were inoculated from the parent cultures. The tubes were incubated at 37° C and received at intervals one or two drops of penicillin of known potency (a Pfizer product containing about 1050 units per mg.). Growth was read roughly by turbidimetric comparison with graded standards consisting of phenolised organisms. At intervals standard loopfuls were plated on to blood-agar. Suitable controls showed that not enough penicillin was carried over on to the blood-agar to inhibit growth.

Results.—Table I shows a typical experiment with a culture of *Staphylococcus aureus* freshly isolated from a wound. Rapid and complete lysis occurred when penicillin was added early in the growth cycle to tubes which had developed considerable opacity

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24 hr. in the tubes to which penicillin was added early, whereas tubes to which it was added later gave confluent growths after 4 days' incubation, as did the control tubes without penicillin. Similar results were obtained with three other strains of staphylococci including the Oxford strain. Lysis however was not always permanent; fresh growth sometimes occurred in tubes which had completely lysed. A fifth strain of staphylococcus (E

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it was added in the early hours of growth. Meningococci (5 strains) were also easily lysed.

With 4 strains of group A hæmolytic streptococci no satisfactory evidence of lysis was obtained. In one experiment in which 5, 2·5, and 0·5 units per c.cm. of peni-

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TABLE I—EFFECT OF PENICILLIN ON *Staph. aureus* IN BROTH

Tube	Hours								Days		
	0	*1½*	*3½*	5	*6½*	9	*12½*	25	*2*	*3*	*6*
1	0 r	0	±	±	±	0	0	0	0	0	0
2	0	0 r	±	±	±	0	0	0	0	0	0
3	0	0	2 r	3	2	0	0	0	0	0	0
4	0	0	2	4 r	1	4	3	1	±	±	±
5	0	0	2	4	5 r	6	6	7	3	3	3
6	0	0	2	4	5	6 r	6	8	6	5	5
7	0	0	2	4	5	6	6 r	8	7	6	6
8	0	0	2	4	5	6	6	8 r	8	8	8
9 (no penicillin)	0	0	2	4	5	6	6	8	8 +	8 +	8 +

0 = clear tube; ± = trace of opacity.
1–8 + = approximate degree of opacity.
r = 0·025 c.cm. of penicillin added (final concentration 0·5 unit per c.cm.).

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when it was added; but in all tubes, even in those to which penicillin was added at once, heavy growth had started again by the 6th day of incubation.

EXPERIMENTS WITH SOLID MEDIA

Methods.—The methods were varied according to the purpose of the experiments. Usually, a porcelain cylinder, slightly warmed (*Brit. med. Bull.* 1944), was placed in the centre of each of a series of 5% horse-blood agar plates; 0·1 c.cm. of penicillin solution was put into each cylinder. Plates were inoculated by means of sterile throat swabs dipped in broth or serum-broth cultures and spread evenly in streaks radiating from the central cylinder. The concentration of penicillin, the number of cultures on each plate, and the order and time of adding cultures and penicillin were varied in different experiments. When different concentrations of penicillin were used in the same experiment, it was convenient to use several cylinders to a plate inoculated with only one culture. Plates were incubated at 37° C.

Increase in size of inhibition zones during growth.—In the experiment illustrated in table II, 6 cultures were spread radially on each of 5 blood plates, each of which received 0·1 c.cm. of penicillin (100 units per c.cm.) in a central cylinder. Successive plates were removed to the ice-chest after 5, 6, 7, and 22 hours' incubation, and after 48 hours were all compared side by side with the fifth plate which had been incubated all the time. It was clear that with two strains of staphylococci (B 2285 and Oxford) and with the pneumococcus (A 2708) there was a considerable increase in size of zones during incubation. With the rather resistant staphylococcus E 701 referred to earlier, the increase was less but still significant. In other words, with these cultures colonies which had been visible in the earlier hours of growth had been lysed. These results were confirmed by examination under a plate microscope (× 10 magnification). No significant increase in the size of inhibition zones occurred after 22 hours' incubation. With hæmolytic streptococci it was impossible to obtain satisfactory evidence of lysis. Careful examination with the plate microscope failed to show that colonies once visible ever disappeared.

TABLE II—DEVELOPMENT OF INHIBITION ZONES DURING GROWTH ON BLOOD PLATES WITH PENICILLIN

No of plate	Hours of incubation	Cultures					
		Staph. aureus			*Strep. pyogenes*		Pneumococcus A2708
		B2285	E701	Oxford	E447	946	
1	5	6	7	8	8	8	9
2	6	7·5	7–8	8	8·5	8	9
3	7	8·5	8	9	7·5	7	11
4	22	13·5 (10)	10	14 (9)	8	9–10	15 (13)
5	48	14 (10)	11 (10)	15 (9)	8–9	9–10	14–15

Figures indicate the distance in mm., measured from the inner edge of the zones to the outer edge of the cen[illegible] (100 units per c.cm.). Where the exact edge [illegible] to define two figures are given, the first indic[illegible] growth, the second (in parentheses) the limit o[illegible] lysis).

Similar results were obtained in other experiments in which penicillin was used, in concentrations of 1000, 100, and 10 units per c.cm. Cultures of meningococci were also observed to undergo lysis during incubation.

Occurrence of ill-defined zones of inhibition.—Ill-defined zones of inhibition on solid media have developed in greater or less degree with all the cultures I have tested. A hint of these is given by the Oxford workers (Abraham et al. 1941), who mentioned haloes of partial inhibition which they could not explain or control. Since measurement at intervals of the zones showed that, apart from the doubtful case of hæmolytic streptococci, lysis was taking place, it seemed likely that the key to these ill-defined zones lay in the relative speeds of diffusion of penicillin and of growth of the cultures.

Effect of adding penicillin and cultures at different times.—This interpretation of the inhibition zones was shown to be valid by two types of experiment. In the first (table III) a series of plates was inoculated with *Staph. aureus*, and penicillin (100 units per c.cm.) was added to successive plates at intervals. The later the penicillin was added, the smaller and less well-defined was the zone, until when penicillin was added after 22 hours' incubation there was no zone of inhibition at all.

TABLE III—EFFECT OF ADDING PENICILLIN AT INTERVALS TO PLATES INOCULATED WITH *Staph. aureus*

Plate	Time of adding penicillin (hr. after	Time of reading plates (hr. after inoculation)		
1	0	10	16	16
2	2½	7	14	14
3	6	No zone	1–2 Ill-defined	1–2
4	22	..	No zone	No zone

Figures give zones in mm. as in table II.
Penicillin concentration 100 units per c.cm.

In the second type of experiment, penicillin was added first to a series of plates which were then inoculated at intervals. Table IV shows an experiment with 3 sets of blood plates, each of which received 0·1 c.cm. of penicillin solution (100 units per c.cm.) in a central cylinder. Set A was kept in the ice-chest, set B at room temperature, and set C at 37° C. One plate of each set was inoculated at intervals with throat swabs dipped in cultures of two strains of staphylococci, a hæmolytic streptococcus, and a pneumococcus. The swabs were streaked radially from the cylinder. It is clear that penicillin had continued to diffuse in an inhibitory concentration for the different organisms in all the plates for 2 days, and in the plates left in the ice-chest and at room temperature for 3 days, whereas in plates left at 37° C for 3 days it had become reduced by inactivation to a non-inhibitory level for all the cultures. Similar results have been obtained with concentrations of 10, 5, and 1 units per c.cm.

Another feature of the inhibition zones in this and similar experiments must be mentioned. When penicillin and culture were added at the same time the zones were of the usual type for the different organisms. With *Staph. aureus* B 2285 (a highly sensitive strain) the zone (10·5–11 mm.) after 18 hours' incubation consisted of an inner portion in which the blood-agar was unhæmolysed and an outer portion showing hæmolysis and ghost-like colonies. With the less sensitive strain E 701 the inhibition zone was almost entirely one of unhæmolysed blood and the outer zone of hæmolysis and ghost-like

TABLE IV—GROWTH ON BLOOD PLATES STORED FOR DIFFERENT TIMES AFTER ADDING PENICILLIN

	Days of storage at time of inoculation	Conditions of storage		
		Series A	Series B	Series C
		4° C	Room temperature	37° C
Staph. aureus (strain B2285)	0	11	10·5	11
	1	14	17·5	21
	2	19	22	24·5
	3	20·5	25	0
	6	21	18	..
Staph. aureus (strain E701)	0	6	6	7
	1	12	13·5	15
	2	13·5	14·5	0
	3	14	14	0
	6	0	0	..
Strep. pyogenes (E447)	0	7	8	8
	1	16	18	23·5
	2	21·5	25	30
	3	25	30	0
	6	33	> 39	..
Pneumococcus (A2708)	0	11	12	12
	1	18·5	21	25·5
	2	22	25	31
	3	27	32	0
	6	32	39	..

Figures indicate size of inhibition zones as in previous tables. Readings were made after 18 hours' incubation of plates. Penicillin concentration 100 units per c.cm.

colonies was very small. On the other hand, in plates which had received penicillin 1–6 days before inoculation, inhibition zones with both strains were more clear-cut and showed no outer zone of hæmolysis apart from the small area given by normal growth.

DISCUSSION

Garrod (1945) has wisely indicated the danger of drawing hasty conclusions from work done with impure preparations of penicillin. The present experiments, while the [illegible] fundamental action of [illegible] which may prove fru[illegible]

It is cle[illegible] tic, bactericidal, and bacteriolytic. The exact conditions in which one or other of these effects predominates, and the extent to which they are interdependent remain to be determined, but it is already clear that penicillin, like many other inhibitory agents, is particularly effective against young cells. A few words of explanation are here necessary. Garrod (1945) found that though penicillin killed young organisms more rapidly than an equal number of old organisms, it did kill both rapidly. Now Garrod's old and young cultures were both inoculated into nutrient br[illegible] medium in [illegible] would hav[illegible] penicillin to a mature broth culture, in which fresh growth is relatively insignificant. In those conditions, though more accurate quantitative work is necessary, it appears to have little bactericidal power.

It is desirable, in studying the effect of penicillin on organisms in different phases of the growth cycle, to make a clear distinction between the age of the *parent* culture, and the age of the cells in their new medium. It [illegible]d cells transferred to a ne[illegible] penicillin, even though the [illegible] some of the processes of [illegible]y occur during the lag phase, and that they thereby become vulnerable to the action of penicillin.

In fact, we do not yet know at what stage in the growth cycle penicillin exerts its maximal effect; it may be on organisms in the lag phase, on organisms just coming out of the lag phase, or on organisms just entering or in the logarithmic phase.

The experiments with liquid and solid media here described, together with those of other workers and especi[illegible] cycle [illegible] ance i[illegible] many [illegible] the a[illegible] penicillin and culture are added to a solid medium at the same time, the progressive increase in size of inhibition zones during incubation is clear evidence that lysis is occurring. With a very rapidly growing culture growth can be seen in the early hours of incubation right up to [illegible] lysis of the invisible organisms presumably occurs. In [illegible] ne however [illegible] in effective [illegible] cells are too [illegible] by the fact th[illegible]ion at all [illegible] 1941) sta[illegible]tically cor[illegible]n continues for much longer is however evident from table IV, which shows the great increase in size of zones obtained when plat[illegible] after the penicilli[illegible] these conditions, [illegible] slowly during the critical early hours in which the organisms can be completely lysed, the final zones after 18 hours' incubation are much more clear-cut and easier to measure than when penicillin and culture are added at the same time.

These findings may have important applications in vivo. It is certain that conditions in the animal body are quite different from those of a laboratory culture. In the laboratory the organisms are subcultured, so many at a time, into fresh media, and so they all (approximately) start dividing a[illegible] "persisters" w[illegible] in starting to gr[illegible] the other hand, t[illegible] ing by a contin[illegible] steps. We may picture two extreme types of lesion—the acute fulminatin[illegible] state of intense [illegible] logarithmic phas[illegible] chronic locali[illegible] are in a [illegible] rapidly. [illegible] that pen[illegible] the first t[illegible] not only [illegible] get the p[illegible] of the lesion. The physiological state of the organisms may be of first importance in determining the success of penicillin therapy.

SUMMARY

The effect of penicillin on sensitive organisms in liquid and solid media depends on the phase of growth during which the penicillin is added.

Young cells are particularly susceptible to its action and may be lysed; mature cultures are relatively insusceptible and are neither lysed nor readily killed.

Lysis of young cultures by penicillin has been demonstrated with staphylococci, pneumococci, and meningococci, but not with hæmolytic streptococci (but see Todd 1945).

The size and nature of the [illegible] acute infections in which [illegible]rring.

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TRACHEOTOMY IN BULBAR POLIOMYELITIS

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IT is not generally realised that in bulbar poliomyelitis tracheotomy may be necessary to save life. Weakness of the abductors of the vocal cords, and adductor spasm from irritation of secretion and food which cannot be properly swallowed and trickles into the larynx, may cause a most distressing situation in which the patient struggles to get breath into his chest, making crowing noises when he is successful similar to those of a child with laryngismus stridulus. If in addition there is weakness of the diaphragm the position is still more grave.

CASE-HISTORY

A dental officer, aged 33, was admitted with the complaint that he had been unable to swallow solids or liquids for 2 days. A month previously he had developed nasal discharge and a dry feeling in the throat with slight cough, which lasted for 3 weeks. Nine and 5 days before admission he felt unexplainably tired for a day. Four days before admission, at 1 A.M. he started to vomit, and this continued for 2 days. He then found that he was unable to swallow either solids or liquids. On the morning of admission he noticed slight diplopia on looking upwards, and weakness of the right side of the face. That evening he developed hiccup.

On admission his temperature was 98.6° F, pulse-rate 96, and respiration rate 20 per min. He was exhausted from slight pyrexia and absence of food and drink for 2 days. There were two pearly spots about 2 mm. in diameter on the left tonsil. Except for the central nervous system, other clinical findings were negative.

Central nervous system.—Pupils reacted sluggishly to light. There was nystagmus when he tried to fix his eyes in any position, very fine and rapid when he looked to the right, when there was slight diplopia, less rapid and coarser when he looked to the left. Weakness of right side of the face, lower motor neurone type, and of right side of the palate and tongue. Complete loss of the swallowing reflex, and weakness of both sternomastoids, especially the right. Weakness of the right diaphragm, shown on admission by diminished movement and air entry at the base of the right lung, and confirmed during convalescence by paradoxical movement of the diaphragm on sniffing and coughing during X-ray screening.

Laboratory reports.—Cultures from throat swabs gave non-hæmolytic streptococci, some diphtheroids, and a few colonies of *Staphylococcus aureus* and *albus*. White blood-cells 21,700 per c.mm. (90·5% polymorphs, 6% lymphocytes, and 3·5% large mononuclears). Cerebrospinal fluid was clear and colourless, with slightly increased initial pressure; cell-count 8 per c.mm., protein 30, chlorides 790 mg. per 100 c.cm; Wassermann reaction negative; Lange 0 0 0 0 0 0 0 0 0 0. Blood Kahn reaction negative.

Progress.—He was given rectal salines and was fed by stomach-tube with citrated milk containing glucose, egg, and thiamine. The night after admission his breathing became increasingly difficult owing to adductor spasm of the larynx. He was struggling to get breath into his chest, and sometimes got it in with an inspiratory crowing sound. The spasm did not respond to atropine, and tracheotomy was therefore done, under local anæsthesia, with immediate relief.

His greatest trouble for the next few weeks was accumulation in the pharynx and larynx of saliva and other secretion he could not swallow. A catheter connected to an electric sucker was passed into the tracheotomy tube from time to time to aspirate this. He got rid of some of the secretion by hawking it up with much difficulty and noise. The usual post-tracheotomy tracheitis was possibly limited by the 120,000 units of penicillin given daily intramuscularly for 5 days after the operation. His temperature, which was 99–100° on the day before and for 2 days after the tracheotomy, then settled, but again rose to 99–99·4° in the evenings between the sixth and twelfth days after tracheotomy, after which it remained normal. Iron, liver, ascorbic acid, and 'Adexolin' were added to the feeds which were given by a Ryle tube left in position, except for removal for cleaning, with its end slung over the right ear to support the angle of the mouth on the side of the facial paresis. Two weeks after admission he was allowed to sit up in a chair. His white-cell count was then 9000 per c.mm. (60% polymorphs, 32% lymphocytes, 6% large mononuclears, 0·5% eosinophils, and 0·5% basophils). He then had only one-third abduction of his vocal cords, but had regained most of the power of his sternomastoids and quite a lot of the power of his face and palate. Five weeks after tracheotomy he could swallow some fluid for the first time. After six weeks, during which he gained 5 lb., the Ryle tube and tracheotomy tube were removed. Semi-solids were cautiously added to the diet, until 3 months after the onset he was taking almost normal meals, though he was having attacks of closure of the glottis for a few seconds about once a week, and X-ray screening and films showed that some barium collected in the vallecula and pyriform fossæ. Five months after the onset he had two-thirds abduction of the vocal cords and almost full movement of the face and palate.

DISCUSSION

Chevalier Jackson[1] gives this excellent description of laryngeal dyspnœa:

> "You will note that this child has indrawing at the suprasternal notch and indrawing at the epigastrium. With each inspiration it is noticed that there is drawing inward of the abdominal walls just below the xiphoid. You will notice also that there is indrawing at the intercostal spaces. Now there is no condition whatever except obstruction of the airway above the clavicle, usually in the larynx, that will produce this kind of indrawing. You do not see it in the dyspnœa due to disease of the heart nor the dyspnœa of pneumonia nor of asthma nor of any other intrathoracic condition.
>
> "Now there is another thing; you notice how restless the child is; his face is full of anxiety. He is drowsy, his eyelids are heavy but he dare not go to sleep because he has learned that when he drops off to sleep, or doses, he begins to suffocate and he wakens with a violent, terrorized start. That means impending asphyxia.
>
> "The diagnosis in this case is obstructive laryngeal dyspnœa. You very properly say that dyspnœa is a symptom and not a disease. But I insist that this child cannot wait for air until a complete ultimate diagnosis is determined. We know from these signs that there is obstruction of the airway in the region of the larynx and that we can save the child's life by tracheotomy."

He goes on to explain why the anæsthetic must be local, because general anæsthesia would remove the action of the accessory muscles of respiration and so possibly cause death by asphyxia.

Galloway[2] quotes 3 cases of bulbar poliomyelitis in which tracheotomy was indicated, in 2 of which it was done in time and saved life. In one of these the tracheotomy tube was removed after 23 days and the patient left hospital after a month; in the other the tube was removed in 10 days and the patient left hospital after 19 days. In the first of these cases 60,000 units of penicillin were given in the first 36 hours and then sulphadiazine was given for a week; in the second neither of these drugs was used.

An important point in these cases is that saliva and nasal secretion cannot be swallowed, and collect in the pharynx and overflow into the larynx and trachea; so the patient may be suffocated by his own secretions. In addition, the vocal cords may assume an adducted position either because of selective paralysis of the abductors or because the adductors are normally stronger than the abductors so if both are weakened the adductor factor may become relatively increased, especially under the stimulus of irritation from saliva trickling into the larynx. If the diaphragm is partially paralysed, as it was in our case, this laryngeal obstruction can be particularly embarrassing. The effect of the resulting anoxia on the anterior horn cells supplying the larynx and diaphragm established a vicious circle.

Next to tracheotomy the most important measure is aspiration with an electric aspirator through a catheter passed into the tracheotomy tube as often as necessary. The normal daily secretion of saliva is about 1000 c.cm. During the patient's early attempts to swallow water or milk, some may pass into the trachea but can be removed by prompt use of the aspirator.

There is no evidence that penicillin has any effect on the virus of poliomyelitis, but it would almost certainly limit the usual post-tracheotomy tracheitis and inhibit lung inflammation arising from inhalation of infected secretions and inefficient coughing. Since such factors could in a critical case be decisive there seems good reason to give penicillin and sulphathiazole during the week after tracheotomy.

We would give a future case more thorough laryngeal rest by strictly limiting the use of the voice until recovery was advanced.

Cases which require tracheotomy and artificial respiration would probably be better treated with a Bragg-Paul pulsator than in a Drinker respirator, because the tracheotomy opening lies inside the respirator when its air-tight collar is fitted. In our case, it was not necessary to use the respirator except as a rehearsal for possible emergency, but we solved the difficulty by running a no. 10 Jacques catheter from the tracheotomy tube through the collar to the outside air. A second small catheter for aspiration of secretions could be introduced in the same way. If artificial respiration is used there is an additional reason for keeping the trachea clear, because the apparatus would otherwise suck secretions into the lung.

SUMMARY

Laryngeal obstruction is a possible cause of dyspnœa, anoxia, and death in bulbar poliomyelitis. It may occur from adduction of the vocal cords, or from filling of the larynx with saliva and secretions of the nose and throat which cannot be swallowed owing to paralysis of pharynx and œsophagus, or from both these causes.

The treatment suggested includes tracheotomy, which should not be left until the patient is in extremis;

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[1] *Surg. Clin. N. Amer.* 1935, **15**, 117.

[2] Galloway, T. C. *J. Amer. med. Ass.* 1943, **123**, 1096.

aspiration by a rubber catheter passed from time to time into the tracheotomy tube and connected with an electric sucker; penicillin and sulphathiazole during the first week; vocal rest; and a nutritious fluid diet with adequate vitamins A and B_1 given by Ryle tube, which can be tolerated for weeks with occasional removal for cleaning.

Preliminary Communications

DDT TREATMENT OF MANGE (SCABIES) IN RABBITS

Psoroptic mange (ear mange) has occurred fairly often over a period of years among the stock rabbits in the Medical Research Institute at Yaba. Owing to war conditions it has become necessary to augment the stock by local purchase and this has led to the introduction of sarcoptic mange (head mange). Inspection of the stock, which owing to a pasteurella epidemic had been reduced to 25 animals, showed that 5 were infected with psoroptic and 6 with sarcoptic mange and it was decided to treat them with

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fore treatment the animals
tes found in all of them;
notoedres sp. and the
The disease was present in
varying degrees of severity in both types. No preliminary cleansing was attempted even where there was thick encrustation, except that in 2 animals suffering from severe head mange the crusts which had formed large bosses on the nose were gently removed with forceps.

In the psoroptic cases infection was confined to the external auditory meatus and the animals were in good

solution. Infected feet were dipped in the solution to ensure penetration between the claws. The remaining rabbit, with a sarcoptic infection, was used as a control and treated in a similar manner but with acetone only. The animals were kept in separate cages throughout the experiment.

None of the animals showed any untoward reaction, local or systemic. There was remarkable and rapid clinical improvement in the rabbits treated with DDT, and no further treatment was given until the end of two weeks. They were then re-examined. The 5 psoroptic cases showed no parasites, but in 2 of the sarcoptic cases dead mites were found and the DDT solution was re-applied. The control animal showed no clinical improvement and living mites were present in considerable numbers. Four weeks after the initial treatment the 10 rabbits treated with DDT showed no parasites and were clinically free from disease; the control was still infected.

It is interesting that a male rabbit with psoroptic mange of the ears developed a small area of notoedres infection on the nose about two weeks after the initial treatment. On inquiry it was found that it had been mated with a female infected with notoedres some weeks previously; the area cleared up rapidly with a single application of DDT.

CONCLUSION

Rabbit mange of the sarcoptic and psoroptic types can be rapidly and easily cured by the application of 5% DDT in acetone. Treatment of human scabies on similar lines suggests itself, but the case of poisoning recently reported by Wigglesworth[1] shows that a solution in acetone would be unsafe for extensive application to the human body, and I understand that Kenneth Mellanby has tried an oily solution of DDT in human scabies with little success.

I am indebted to the Director of Medical Services, Nigeria, for permission to publish this note.

B. G. T. ELMES, M.D. EDIN., F.R.C.P.E.
Assistant Director of Laboratory Services,
Medical Research Institute, Yaba, Nigeria

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1. Wigglesworth, V. B. *Brit. med. J.* April 14, 1945, p. 517.

Medical Societies

ROYAL SOCIETY OF MEDICINE

At a meeting of the section of comparative medicine, to which fellows of the Royal Society of Tropical Medicine were invited, on April 18, with Dr. H. J. PARISH in the chair, a discussion on

Control of the Rickettsial Infections

was opened by Lieut.-Colonel C. H. STUART-HARRIS, RAMC, who spoke on epidemic louse-borne typhus fever. The considerable advances of the past few years had enabled epidemic typhus to be effectively controlled in the Army and gave grounds for hope that outbreaks in civilian populations could be arrested. Control of the louse vector by delousing measures had been greatly extended by the use of chemical insecticides

of cases in hospital. Rickettsial antigens were of great value in epidemiology but not in early diagnosis. The Castaneda slide-agglutination test with a coloured concentrated OX19 suspension was of great assistance in field survey and case-finding. The third control measure was immunisation with rickettsial vaccines which had been modified chiefly in the direction of improving their rickettsial content. Ether treatment (Craigie) of yolk-sac cultures concentrated the rickettsias and separated unwanted egg yolk. Large civilian epidemics of typhus in 1942 and 1943 in Egypt and North Africa had exposed British troops to a risk of infection. Even before the introduction of mass immunisation, however, only a

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Colonel Stuart-Harris attributed the general success of the control measures employed to the careful search for
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circumscribed Naples epidemic, but prospects were bright if there were sufficient numbers of trained workers and supplies of DDT.

Mr. JAMES CARMICHAEL, D.SC., opened the discussion from the veterinary angle. He said that heart-water, which was of economic importance among sheep and cattle in many parts of tropical and South Africa, chiefly affected imported animals, the native sheep being resistant. The infection, which was transmitted by ticks, produced an accumulation of fluid in the pericardial sac, and rickettsias were found in endothelial cells of the kidney and brain. Control could not be attained by using vaccines, serum, or chemotherapy on the vertebrate host, but
the intermediate host by
arsenicals was successfu
dition was important
to humans by means
as largely responsible
for maintaining a reservoir of infected ticks, but the ticks on domestic dogs were readily destroyed by using derris root or pyrethrum or arsenical washes.

Dr. R. LEWTHWAITE described scrub typhus, or tsutsugamushi. Comparatively unimportant before the war, it had flared up alarmingly in both south-east and south-west Pacific theatres of war. An area which had only a trivial incidence of scrub-typhus before the war might be responsible for hundreds of cases among the troops with resulting morbidity and mortality on a considerable scale. The prevalence was limited to pin-point areas (typhus "islands") where secondary-man-made vegetation had replaced the virgin jungle. The rats infesting such areas were carriers of the rickettsias, and the mites harboured in their ears were responsible for conveying the infection to man. The rickettsial infection persisted in the mite during the whole cycle of development, but it was the larval mite which actually transferred the rickettsias to man. The disease had assumed a high incidence during the monsoon seasons and the troops feared it because of its mysterious nature and mortality. The clinical picture, except for the primary eschar, resembled European louse-borne typhus, and the histological appearances of the two diseases were identical. Control measures were anti-rat, anti-mite, and, anti-rickettsial. Clearing of camp-sites was aided by flame-throwers for burning the scrub vegetation and grass, and bulldozers could be used for removing the top six inches of soil. The employment of native labourers on such sites was important because of their apparent immunity. Mites were relatively slowly affected by DDT, and phthalates were more effective. The most recently introduced variety, dibutyl phthalate, was incorporated on clothing which could be washed seven times and would still kill mites. Its rigid use had resulted in a lowering of the incidence of typhus by 75%. Anti-rickettsial measures could not be discussed, for security reasons. Yolk-sac cultures could be obtained, but earlier work with vaccines indicated that animal tissues, such as spleen or brain, or peritoneal washings either produced infection, or, if inactivated, produced no immunity. The problem was under active consideration by new minds with new methods.

Dr. FORREST FULTON spoke of the work carried out at the National Institute for Medical Research on the testing of epidemic rickettsial vaccines and of the studies of the antigenic relationship of epidemic and murine rickettsias. The desire to compare the efficiency in the laboratory of yolk-sac and mouse-lung vaccines led to the evaluation of various methods of active and passive immunisation and study of the serological changes following immunisation. An effort was made to standardise rickettsial vaccines by means of a simple counting technique, and when care was taken thus to equalise the rickettsial content, yolk-sac and lung vaccines gave similar degrees of protection. An active immunity test which employed rickettsial toxin intravenously in mice (Craigie) was thought to be the most effective means of comparing vaccines thus far introduced. Dr. Fulton discussed possible explanations of the observed antigenic differences between epidemic and murine rickettsias.

Mr. A. FELIX, DSC, FRS, noted that one of the outstanding advances recently achieved in typhus had come from the work of entomologists and chemists rather than bacteriologists. He thought that insufficient attention had been paid to the treatment of the disease with specific serum and considered that the sera thus far tested on human cases yielded poor results because of their poor content of OX19 antibody.

Brigadier-General LEON A. FOX, field director of the Typhus Commission, US Army, gave an account of the measures taken to control the Naples epidemic. He laid stress on the importance of inducing a state of non-infestibility by dusting a large proportion of the population with DDT powder. He was more enthusiastic than Colonel Stuart-Harris concerning the value of immunisation. The American Army had not yet had a death from epidemic typhus and he wondered if the one vaccinated British soldier mentioned who had died of typhus had really been immunised with typhus vaccine. (Colonel Stuart-Harris later confirmed that this man had been seen by him personally and that the personal record indicated immunisation with typhus vaccine nine months before the attack of typhus. No stimulating dose of vaccine had however been given at the specified six-months' interval.) General Fox asked Dr. Lewthwaite for details of an observed instance of immunity in natives following an attack of scrub typhus.

Mr. E. O. LONGLEY, MRCVS, described his own attack of typhus, possibly contracted from a canine source in Nigeria. Canine typhus in imported dogs was usually fatal and accompanied by fever, tachycardia, splenomegaly, and repeated epistaxes.

Mr. N. H. HOLE, MRCVS, of Weybridge, whose paper was read by Mr. R. Lovell, PH D, described an infectious keratoconjunctivitis in cattle recently shown to be due to a rickettsial agent. Lacrimation was followed by conjunctivitis and later by clouding of the cornea. Inclusions were found in the cytoplasm of epithelial cells in the form of bipolar, triangular, or ring-like bodies staining blue with Giemsa. Transmission to other animals was difficult but had been transmitted to the eyes of a normal bovine. The disease itself was comparatively mild.

The CHAIRMAN asked what was the possible value in typhus of convalescent or hyperimmune serum, but Dr. C. R. AMIES, from personal experience in the Middle East, doubted whether either serum affected the course of the disease.

Dr. W. M. CROFTON discussed the results of blood-cultures in cases of typhus fever in Ireland.

Dr. LEWTHWAITE described an instance in labourers employed on an oil-palm estate which indicated that an attack of scrub typhus gave effective immunity, so that subsequent exposure in a known scrub typhus area was without harmful effect.

Reviews of Books

Industrial Ophthalmology

HEDWIG S. KUHN, MD. (Kimpton. Pp. 294. 32*s.* 6*d.*)

THIS book gives a full account of the measures at present taken in American industry to safeguard the eyes of the worker and to secure maximum efficiency from each pair of eyes, in order to increase production. Dr. Kuhn recommends, first, that the visual acuity of each new employee should be estimated and recorded, and that glasses should be provided if necessary. This is done so that each person may have the job most suited to his visual capacity, and sc [illegible] claims for eyesight damage may be [illegible]. Secondly, that where the job carries "eye hazards," there should be, he says, a "goggles programme" to protect the eyes from flying particles, gases, chemicals, and heat. If such a programme is to succeed, a spectacle mechanic must be appointed whose constant care is to see that goggles fit correctly and are comfortable. A section on the treatment of industrial eye injuries is included. The lighting of the plant and the avoidance of shadows are illustrated by impressive photographs. Some firms have painted their machinery in such colours that moving parts are shown up in high relief. Though some of the measures here described are employed by firms in this country, a fully developed eye programme will not be found anywhere; and British industry can learn much from this book. Medical officers in charge of industrial plants, especially, will find much to interest them. It is not an easy book to read, being verbose and repetitive; but the standard of production, particularly of the photographs, leaves nothing to be desired.

Physical Medicine in General Practice

WILLIAM BIERMAN, MD, physical therapist, Mount Sinai Hospital, New York. (Hamilton. Pp. 654. 37*s.*)

THE object of this book is to tell the general practitioner and the specialist how and when to use physical treatment in conjunction with the other methods which he is accustomed to employ; and Dr. Bierman successfully attains this object. He presents the basic principles of physical treatment in both its medical and surgical aspects. The sections on hydrotherapy and electrotherapy, massage, and exercise are clearly written and present the essentials. The second half of the book is devoted to the application of these methods in the various specialties. Perhaps not enough stress is laid on the methods which the author has found of particular value in his own practice. The dermatologist and gynæcologist, among others, will find much useful, but not enough specific guidance. The physical medicine department has become an essential part of every general hospital, and Dr. Bierman shows how it can be exploited for the advantage of patients.

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THE LANCET

LONDON: SATURDAY, MAY 5, 1945

First Fruits of Peace

THAT a man should take up arms in defence of his country, and lay them down again, quickly returning to the arts of peace, when danger is over is a commonplace of history; that a man feels pain on leaving home and finds joy in return is a commonplace of literature; that none of these processes are as simple as they seem is a commonplace of psychology. The main hindrance to the ordinary man's understanding, and perplexity to the administrator's, lies in the fact that each individual has his own private life to lead, but he also lives it in and as part of a group. An administrative order can summon a man from his home to join the Forces, but only the experience of group life will turn him into a soldier; another administrative order can return a man to a life of more individual and less corporate responsibility, but no decree will readjust him to the civilian world again. An army, if its spirit is good, knows how to help the recruit to make the necessary changes in outlook that group-living requires. The army has this capacity, because it is aware that it is a group within but different from the community as a whole: is there a similar awareness on the civilian side of the community that the assimilation of millions of its own people—and they are those to whom it owes life itself—is a task calling for every bit as much detailed care as that other transmutation into military formations? On the answer to this question depends not only the smooth return of our prisoners-of-war, but a fruitful issue to the enormous transformation of demobilisation, and indeed, to take a still wider issue, the rehabilitation of whole populations in Europe and Asia.

At the present time the questions now raised are being answered in a practical way by the Army and by other groups within the community; so it is possible to apply "clinical" criteria to group relationships, which a generation ago were thought to be the field of operation either of politicians or of Providence. In meeting the demands of the present complex situation we are in a better position than at a similar time in the last war. In the first place the "disintegration of the community" is less than it was then: indeed the opposite, despite what is believed in influential circles, is the more true. Summing up their study of "intra-group tension" BION and RICKMAN[1] concluded that the "good health" of a community seems to depend on its members having a common purpose, whether in the overcoming of an enemy or in creative constructions in the field of social relationships and physical amenities. If there are subgroups these should be valued for the contribution they can make to the main group (the community); similarly each individual member is valued for his contribution to the group and has free movement within it, that freedom being limited only by the generally accepted conditions devised and imposed by the group. There must be a capacity to face discontent within the group, to explore its origins and its collateral as well as direct symptoms with the friendly detachment of a clinician and with clinical fervour; and there must also be a capacity to absorb new members and lose members without fear of losing group individuality—i.e., group character must be tough and yet flexible. Judged by these standards the present situation is more favourable than "last time"; our common purpose has been not only unity in overthrowing an enemy but also a resolution to improve social relationships, not by slogans but by experiments in which the fundamentals have been thought out in advance.

One of these experiments deserves to be watched with the closest attention, both because of what it is now doing and because of its possibly wider application. A great number of men were called from home into the Army and became incorporated in fighting units; they were later taken prisoner, were thus isolated from their fellow-countrymen, and were unable either to fight or return home; they were herded together without reference to their former membership of the fighting units with which they had trained and were compelled under difficult conditions to re-form into a new kind of group in the prisoner-of-war camps, where with varying degrees of passive or active resistance to the enemy they dragged out the weary years. Now they are liberated, return for resorption into their own army, to fight or to take an active part in civilian life. Here indeed is a problem in individual and group readjustments. To discharge the prisoner-of-war during a campaign, particularly—however beflagged the ports of welcome, however great the public thanks—without active participation by the army in his reorientation to his new group, would be to foster much personal misery and raise the level of public discontent.

A first glance at the accounts of Civil Resettlement Unit camps, whose existence was made known to the public last week, shows that attention has been paid to the details of comfort, relaxation, and guidance of the men. But reflection on the plan as a whole reveals something of greater significance even than the attention to personal welfare, valuable as that always is: the Army (a group within the community) is working in the closest association with civilian organisations, social and industrial, which will carry on the resorption process till the soldier becomes fully and actively merged in the civil community from which he sprang. But not the one from which he started! Those war-prison years have changed the soldier in various ways; he would have had to be a man of stone or iron if they had not. The same years have also changed his home country, this stolid England of ours, in many and not always subtle ways; we should be robots or inepts in the ways of living had we learnt nothing, absorbed nothing of value, from the hard pressure of war experience. Both parties—the prisoners returned and we who give them welcome—have to make adjustments to each other and to the changing world we both must fashion to our mutual betterment.

Much is heard in these days of selection of personnel and of "job analysis"; the former studies the capacities of a person, the latter describes the kind of work and working conditions, the physical and mental aptitudes, technical knowledge, and length of training, to do a particular job to a reasonable

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1. Bion, W. R., Rickman, J. *Lancet*, 1943, ii, 678.

standard. But we have already moved on a step: the particular needs of a group within the community—in this case prisoners-of-war—have now been studied in the group. This group has had a specially difficult kind of social experience which calls for a special kind of resettlement; it is getting it in the CRU camps. But the individual is not forgotten; on the contrary his individuality and its enrichment in the process of contributing to the community is the main concern of the new scheme. It is the simultaneous regard for the personality of the individual and the special requirements of the group which makes this experiment in resettlement so valuable for our social health. Neither side—the Individual nor the State—wins *against* the other; each belongs to the other. For this principle the United Nations have fought the Nazis; on this basis only—in the growing complexity of our civilisation—can a new world be built, by such experiments as those mentioned here and from what we care to learn from them.

Streptococcal Cross-infection

THE sources and modes of spread of respiratory infections are as yet imperfectly understood, and the methods for their effective control are still in the experimental stage. Improvements in health and hygiene, new methods of treatment, and other imponderable factors have greatly reduced the mortality of most respiratory diseases, including the childhood fevers. Yet, as BUTLER[1] has lately remarked, the incidence of these infections has not, with a few notable exceptions, shown a parallel downward trend, and a major problem for tomorrow's hygienist will be to devise and apply new methods for a better control of respiratory infections. But first he needs to know more about their epidemiology. The popular conception, for example, that a high carrier-rate of a particular pathogen precedes and predisposes to an outbreak of infection is not always borne out in practice. Thus VOLLUM and WILSON[2] have observed that low carrier-rates of *Streptococcus pyogenes* in residential schools may be followed by sharp outbreaks of streptococcal tonsillitis, while high carrier-rates in school or hospital ward need not be the harbinger of fresh cases of clinical or even latent infection. To explain these anomalies, COBURN[3] invokes the property of "communicability" which a strain of *Strep. pyogenes* may acquire as a result of establishing subacute infection in the host, so that it becomes "host-fast" and can resist the antibacterial defences of the human mucous membranes; it can then readily initiate infection in new hosts. On the side of the host, spread of streptococcal infection is facilitated by a lowered resistance of the respiratory mucosa, due, for example, to antecedent virus infection. Thus bacteriological proof has been adduced that the secondary crippling complications of both measles and influenza are mostly due to streptococcal cross-infection, and rubella has lately been added to the list. HAMBURGER,[4] studying the spread of streptococcal infection in an army camp hospital in America, found that high carrier-rates (45–53%) could exist in wards housing patients with a miscellany of respiratory diseases without any extension of streptococcal infection, whereas in measles and rubella wards outbreaks of streptococcal tonsillitis and scarlet fever were common, and bacteriological cross-infection occurred in 50–60% of the contacts. On the other hand, in conformity with experience here, streptococcal carrier-rates among nurses in these wards remained low.

The next question was to find out how the streptococcus is transferred from one patient to another Since infected saliva expelled during talking and coughing seemed a likely means of environmental contamination, HAMBURGER examined the streptococcal content of the saliva of 156 patients—80 with scarlet fever and 76 with streptococcal pharyngitis or tonsillitis. The saliva, obtained at various stages of the disease, was suitably diluted and plated in blood-agar pour-plates, and the streptococcal colonies were counted after 48 hours' incubation. Of 527 saliva cultures from patients with positive throat cultures, just under two-thirds were positive; patients with heavily positive throat cultures could yield negative saliva cultures. The streptococcal counts in saliva usually ranged from 1000 to 1,000,000 per c.cm. In half the cases the saliva cultures became negative either gradually or abruptly [illegible] in a quarter there was no particular [illegible] the remaining quarter the cultures were either persistently positive or negative. Patients whose counts remained high between the 15th and 30th day were likely to continue as saliva carriers for the period of observation. Sulphonamides, given by mouth in therapeutic doses had no apparent effect on the streptococcal content of saliva or throat swab. This agrees with the experience of VOLLUM and WILSON[2] at the two schools in Wiltshire, where sulphanilamide given by mouth in the acute stages of streptococcal tonsillitis failed to prevent a high incidence of convalescent carriers and sulphapyridine-sulphathiazole lozenges had no definite effect in clearing carriers or protecting contacts. HAMBURGER and his colleagues[5] next sampled the air and dust of the wards for their streptococcal content. Using the Moulton sampler or exposed gentian-violet blood-agar plates, their findings regarding aerial pollution during ward activities have confirmed the earlier work in this country, and parallel samplings of the streptococcal and total bacterial counts at different times indicated that the aerial streptococci were mostly derived from floor-dust and bed-linen. The numbers of hæmolytic streptococci recovered from the dust under and around a single bed varied from 150 to 1,755,000, some patients persistently producing a heavy streptococcal contamination of their environment; later it was noted[6] that this phenomenon was associated with streptococcal nasal carriers rather than saliva excreters. Sheets, blankets, pillow-cases, and pyjamas could become heavily contaminated with streptococci within 6 hours and the air of the ward within 24 hours of the arrival of streptococcal carriers.

The relative importance of direct droplet and dust-borne spread of infection is not easily determined One method of assessment is to test the effect of eliminating one or the other. The oiling of floors and bed-linen, introduced by van den Ende and his colleagues as a dust-suppressive measure, can be employed to eliminate dust-borne infection, and has already been successfully used to control secondary streptococcal infection in measles wards.[7] These new methods have been investigated in America by Robertson and co-workers,[6] using techniques which differ only in detail from those practised here. After oiling the floor and bedclothes in army barracks, they reported a 90% reduction in the bacterial content of the air and "a significant reduction in the number of hospital admissions for respiratory diseases" among the men in these oiled barracks. Life in an army camp is different from that in a civilian community, and these promising reports cannot be regarded as having a general application, but they lend strong support to the importance of dust-borne infection in respiratory diseases. Furthermore the efficiency of aerial disinfection by physical or chemical means depends in considerable degree on a dust-free atmosphere. With fresh developments in these fields we can look forward with hope to breathing clean safe air, just as our forefathers looked forward to drinking clean safe water.

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[1] Butler, W. see *Lancet*, April 28, 1945, p. 536

[2] Vollum, R. L, Wilson, G. S. *Brit. med J.* April 21, 1945, p. 545.

[3] Coburn, A. F. *Nav. med Bull*, *Wash.* 1944, 42, 325.

[4] Hamburger, M. *J. infect. Dis.* 1944, 75, 58, 71.

[5] Hamburger, M, Puck, T. T., Hamburger, V. G., Johnson, M A *Ibid*, 1944, p. 79.

[6] Robertson, O. H, Hamburger, M., Loosli, C. G., Puck, T T., Lemon, H. M., Wise, H. *J. Amer. med. Ass.* 1944, 126, 993.

Diabetic Coma

One of the disappointing features of the treatment of diabetes has been the persistently high mortality in diabetic (hyperglycæmic) coma. In Joslin's[8] opinion the two main reasons are the inadequacy of the facilities available for the treatment of coma and the tendency to administer glucose as well as insulin in the early stages. The figures from his world-famous clinic, recently analysed by Root,[9] are sufficiently striking to carry weight with any impartial observer. In the last 123 consecutive cases of coma treated at the clinic there have been only 2 deaths—a mortality of 1·6%, whereas in a previous series of 525 cases[10] the mortality was 11%. This striking fall is attributed to the increased amount of insulin administered during the first 3 hours of treatment, the average dose during this period was 83 units in the first series and 216 units in the second. At Joslin's clinic the carbon-dioxide content of the venous blood is looked upon as the most reliable guide to what constitutes diabetic coma, and the critical level is taken to be 20 volumes per cent. Root and Carpenter[11] have shown that in diabetic coma the administration of glucose does not raise the respiratory quotient, which suggests that it does not increase carbohydrate combustion. As Root points out, there is ample glucose available in the tissues of the patient with diabetic coma, so that further glucose is not required. Further, glucose may actually do harm, since it makes the effect of insulin hard to assess and may result in anuria; there is experimental evidence,[12] too, that it damages the liver. The trend of modern thought with regard to ketogenesis also favours the view that the use of glucose in the treatment of diabetic coma is illogical. The old concept of fats burning in the flame of carbohydrate is gradually being discarded—as Young remarks, substantial progress has been made away from the carbohydrate fires which were once believed to be necessary for the oxidation of ketone bodies.[13]

The essentials of treatment, as outlined by Root, are that the patient must be treated in a hospital where there is an adequate day-and-night service for such cases. Insulin must be given in adequate dosage as early as possible; insulin given six hours after admission is probably worth unit per unit less than a third of what it is worth during the first hour. The precise amount needed has to be determined in each case, and the blood-sugar level is the most reliable guide as to whether enough is being given. Root emphasises the value of isotonic saline intravenously or subcutaneously in overcoming the dehydration and shock often present. He thinks saline is more effective than blood or plasma, and points out that in diabetic coma there is no loss of blood protein or plasma, but a deficiency of saline and water. He has found gastric lavage a valuable aid to treatment, and Joslin also says he has never regretted washing out the stomach in diabetic coma, though he has often regretted not having done so. No justification is found for the use of alkalis, and the benefits of stimulants in severe peripheral circulatory failure have been found to be temporary and slight. Feeding is begun 4–6 hours after admission in cases responding to treatment—10 grammes of carbohydrate is given hourly, and a total of 50 g. each of protein and fat within the first 24–36 hours.

This latest reminder of the fact that diabetic coma is an emergency due to acute insulin deficiency should be taken to heart by those who have obscured the issue by counteracting the beneficial effect of insulin with glucose. Adequate insulin as early as possible is the secret of success in the treatment of diabetic coma; if this was more generally realised, and

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Annotations

BUTTER-BORNE ENTERIC IN PARIS

The general rise in the endemic level of enteric fevers in the Paris area during the war—1346 notifications in 1942 and 1553 in 1943, compared with about 500 annually before the war—showed an epidemic increase in June, 1944, when 446 notifications were received, against 72 in the previous month.[14] The epidemic was due to *Bact. typhosum* and was marked by an explosive onset, incidence in families, the high age of patients (29% over forty), and rapid cessation.

Water was at first suspected, especially in view of air-raid damage. The incidence, however, did not correspond to the damaged areas and no pollution was found on analysis. In the suburbs, which provided the bulk of the cases, there are wells which may still be (illegally) used in hot weather, but a connexion could only be traced in one family; similarly no link was found with swimming baths or river bathing. The possibilities of infection by food were somewhat simplified by the limited choice open to the population; thus oysters and shellfish could be ruled out. Numerous and detailed inquiries showed that a large majority of the patients were clients of a particular multiple-shop provision-firm, and eventually, by a process of elimination, butter sold by this firm was found to be the only vehicle in common. This conclusion was reinforced by the facts that clients

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7. [illegible] 611.
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10. [illegible] 119,
11. Root, H. F., Carpenter, T. M. *Amer. J. med. Sci.* 1943, 206, 234
12. Astwood, E. B., Flynn, J. M., Krayer, O. *J. clin. Invest.* 1942, 21, 621.
13. Young, F. G. *St Thomas's Hosp. Gaz.* 1944, 42, 64.
14. Cambessédès, M., Boyer, J. *Bull. Off. int. Hyg. publ.* 1944, 36, 293.

of another firm which obtained butter from the same wholesaler were also affected; that the managers of the stores and their families—who presumably were able to obtain large quantities—were particularly affected; and that in one family three children who ate this butter developed typhoid, while their parents who had given their family fresh butter and themselves had eaten some older, slightly rancid, butter from a family parcel, had escaped. Incidentally, of these three children, one had been inoculated against typhoid and had only a slight attack; of two not immunised, one died and the other had a severe attack. The actual derivation of the infection proved impossible to track down, because of the numerous sources of origin and the habit of vendors at that period of mixing various butters to produce an "average" product for retail sale.

The notifications fell from 446 in May to 304 in July and 106 in August. Though the fatality-rate is not given, the infection seems to have been clinically severe.

LYSOZYME, BIOTIN, AND AVIDIN

It seems possible that the studies of Meyer and Laurence into the relationship between avidin and lysozyme may produce some useful results—though not the ones expected. Avidin is a protein constituent of egg-white which inactivates biotin by forming a complex with it. Lysozyme is a bacteriolytic enzyme also present in egg-white, as well as in tears, sputum, and other secretions, which rapidly lyses certain cocci, notably the test organism *Micrococcus lysodeikticus*. Meyer[1] found that avidin preparations possessed lysozyme activity roughly proportional to their avidin activity. He found also that the bacteriolytic activity of lysozyme was increased 8 to 250 times by the addition of traces of biotin. Laurence[2] found that egg-white lysozyme possessed avidin activity, while various samples of avidin possessed parallel avidin and lysozyme activity. It was suggested that these results could be satisfactorily interpreted by regarding lysozyme as an avidin-biotin complex. A previous annotation[3] mentioned some objections to this view. Thus Woolley and Longsworth[4] reported that their avidin preparations, very much purer than those of Meyer and Laurence, possessed no lysozyme activity. There appear also to be considerable differences between the molecular weights of lysozyme and avidin, though the available figures have not been fully confirmed. Furthermore Meyer failed to dissociate lysozyme into avidin and biotin, although biotin can be readily separated from the normal avidin-biotin complex by steaming. It was apparent that the crux of the question lay in the purity of the preparations used (some of the avidin concentrates evidently contained only a few per cent. of pure avidin) and that judgment would have to be postponed until the work had been repeated with comparatively pure avidin and lysozyme.

This necessary check has now been made by Alderton, Lewis, and Fevold,[5] who cannot confirm the results of Meyer and Laurence. Using highly purified avidin and crystalline lysozyme, as well as preparations of lower purity, they find no stimulation of lysozyme activity by the addition of biotin. Pure lysozyme possesses no avidin activity and pure avidin possesses no lysozyme activity. Pure lysozyme contains negligible amounts of biotin; the quantity found (0·009 part per million) is comparable with that reported by other workers for quite unrelated purified proteins such as insulin, casein, and tobacco mosaic virus. It appears probable therefore that lysozyme and avidin have no simple biological relationship and that the results obtained by Meyer and Laurence were due to the imperfect separation of the two proteins. Both are basic proteins, and they have similar isoelectric points (lysozyme pH 10·8 and avidin pH 10·0); so it is not surprising that simple methods of purification fail to separate them.

While the interpretation Meyer and Laurence put on their observations has not stood the test of further investigation there is no reason to doubt the accuracy of the observations themselves. With one exception they are of the kind that would be expected from the use of very impure preparations. The exception is the stimulating effect of biotin on lysozyme activity. Meyer noted that as little as 10 μg. of biotin could increase the bacteriolytic action of lysozyme, against both live and killed cocci, 250 times. Although Alderton and his colleagues found that biotin had no effect on the lytic action of their highly purified lysozyme preparations, the magnitude and apparent reproducibility of the effect described by Meyer make it impossible to dismiss it as an error of observation. The impurities in Meyer's biotin clearly deserve further investigation.

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[1] Meyer, K. *Science*, 1944, 99, 391.
[2] Laurence, W. L. *Ibid*, p. 393.
[3] *Lancet*, 1944, ii, 216.
[4] Woolley, D. W., Longsworth, L. G. *J. biol. Chem.* 1942, 142, 285.
[5] Alderton, G., Lewis, J. C., Fevold, H. L. *Science*, Feb. 9, 1945, p. 151.

ARTHRITIS APHORISMS

In discussing common mistakes in the handling of patients with arthritic and allied complaints, Comroe,[1] writing from the arthritic clinic of the Hospital of Pennsylvania University, complains that doctors commonly treat their arthritic patients without first establishing the diagnosis, while others too often allow contractures to develop and pains to persist because they think only in terms of diagnosis. He urges that every patient with joint symptoms should have a complete history and physical examination, and the appropriate laboratory tests, but this does not mean that affected joints should not be splinted or mild analgesics given during the period of study. He goes on to extract a multitude of lessons from the experience at the clinic, which may be summarised as follows:

Do not depend too much on the sedimentation-rate in the *diagnosis of joint disease. This test should be used in* conjunction with common sense, a carefully taken history, and a thorough physical examination, blood-count, urine analysis, serological test for syphilis, and X-ray films of the involved joint.

Do not tell the patient that the joint is normal merely because the X-ray findings are negative.

It is an error to diagnose gout frequently in females; 95–98% of all gout occurs in males.

Other diseases besides local ones may cause pains and aches in joints and muscles.

Extensive hypertrophic changes in the spine may be found without symptoms.

People over 50 nearly all show X-ray signs of degenerative joint disease, usually symptomless.

Do not attribute pains low down in the back to arthritis merely because there are hypertrophic changes in the lumbar vertebræ or sacroiliac region. Backache is most commonly due to ligamentous and muscular strain Chronic foot strain often causes pain not only in the foot and lower leg but also in the knee and low back.

Syphilis may mimic any form of joint disease.

Conjunctivitis and tenosynovitis are extremely commonly associated with gonorrhœal arthritis.

There is no specific magic bullet for the treatment of rheumatoid arthritis—certainly not a gold one, and gold may be toxic.

Always remember you are treating a human being and not *merely a few joints.*

Do not tell the patient with rheumatoid arthritis to go to bed for a long period without proper exercise and massage; if he lies in bed like a lump of putty, much harm may be done.

Physical therapy alone will not cure most cases of arthritis.

It is easier to prevent a deformity than to correct one.

If you are a physician do not scorn to learn to apply plaster in your cases of arthritis.

Never manipulate joints that are acutely inflamed.

No particular form of vitamin deficiency has ever been shown to produce rheumatoid arthritis.

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[1] Comroe, B. I. *J. Amer. med. Ass.* Feb. 17, 1945, p. 392.

All bath-water is buoyant, whether it is in the patient's home or in a high-priced spa.

We do not yet know the rôle of focal infection in most cases of rheumatoid arthritis.

A protracted need for narcotics in a patient with joint symptoms suggests neoplasm.

Less than 10% of patients with rheumatoid arthritis who become pregnant are relieved of their rheumatoid arthritis for more than 4 to 6 weeks after delivery.

The injections of vaccines, sulphur, chaulmoogra-oil, foreign proteins or the like will not straighten chronically deformed ankylosed joints.

On the whole, Comroe's experience with rheumatoid arthritis is encouraging, for though he advises the physician never to promise a cure he would tell the patient that nine cases out of ten can be definitely improved. In the United States, as in England, there is an urgent need of hospital beds for "rheumatic" patients where a well-planned therapeutic programme can be applied without delay.

ABDOMINAL PAIN IN CHILDHOOD

"There is probably no more interesting, uncertain, or hazardous clinical domain in childhood than acute conditions in the abdomen, and pain is the presenting symptom, the warning signal that something has gone wrong and that it may be serious." It is this background of possible catastrophe that makes every child patient with abdominal pain such an urgent problem. In his review of abdominal pain in childhood, of which this was the opening sentence, Brennemann[1] included tenderness as an essential part of the story, and he put the majority of the more serious abdominal conditions heralded and accompanied by pain into two main categories—those due to obstruction and those due to infection. Colic of infancy he put in a class by itself, pointing out that it is probably more frequent in the breast-fed than in the bottle-fed infant and principally caused either by overfeeding or by the presence of excess of "gas" in the alimentary tract, itself either swallowed air or produced by fermentation. Of the obstructions in early life he stressed the importance of intussusception, with often a deceptive calm after the dramatic onset. A condition less commonly diagnosed, though described by Brennemann as not rare, is congenital ano-rectal stricture with increasing distension of the abdomen and screaming attacks, relieved by a brief course of daily digital dilatation.

In discussing appendicitis, Brennemann voiced the opinion of all children's physicians who are honest with themselves when he wrote: "I still approached" (i.e., after all his experience) "the acutely painful abdomen in a child with more apprehension and a greater feeling of uncertainty than any other domain in childhood." He described the pain as only rarely intense and the fever as rarely more than a "few degrees." Early residual tenderness at a definite point is important and is usually at McBurney's point, though with a retrocoecal appendix it may be higher or more in the flank. Rectal examination he regarded as seldom adding anything to a careful abdominal examination. (This is in contrast to teaching in this country often crystallised in the aphorism attributed to Sir Robert Hutchison: "If you'll put your finger in the rectum you won't put your foot in it.") The diffuse dull pain in the region of the umbilicus with some tenderness, occurring in the course of upper respiratory throat infections, Brennemann attributed to mesenteric lymphadenitis, but he confessed that he did not know how to distinguish satisfactorily between this condition and appendicitis, adding the warning that more than half of all cases of the latter are causally related to throat infections. In discussing his paper, Joseph Colomb quoted two tips: (1) the patient with diaphragmatic pleurisy or pneumonia is too sick too soon to have appendicitis; and (2) a child who is conscious and not forcibly held, who on deep palpation makes no attempt to remove your hand, probably does not have a surgical condition of the abdomen—the converse is not true.

Abdominal pain due to food allergy, according to Ratner,[2] is caused by spasm of smooth muscle, by weal formation or vascular spasm in the gastro-intestinal wall, or by a combination of these factors. He points out that skin-tests are not helpful. The same point is made by Blamontier,[3] who describes an adult whose allergic trouble with mutton appeared to be due to some disintegration product of the meat protein rather than to the protein itself, for which skin-tests were negative. Ratner makes his diagnosis rest on careful history-taking, on prompt relief from pain after subcutaneous adrenaline or oral atropine, and on X-ray observations that the suspected article of food will provoke pylorospasm with delayed gastric emptying, and hypertonicity and hyperperistalsis of the intestine. "The longer I practise allergy," he remarked in discussing his paper later, "the more often I make the diagnosis of no allergy present." His treatment, apart from the avoidance of foods to which the child is sensitive, which may not always be possible, is to give a well-cooked diet, on the view that coagulated albumins cannot act as allergens.

It is perhaps fitting to end with Brennemann's closing words: "the majority of abdominal pains . . . have, in my experience, been of unknown nature and unknown ætiology."

AN INDIAN SCOURGE

Cholera, an epidemic of which is said to have begun in Calcutta among the civilian population, has long been a curse of India. It is essentially a water-borne disease, and outbreaks usually originate from the contamination by carriers of unprotected wells and tanks used for drinking purposes. Widespread epidemics occur in famine years through the failure of the monsoon and winter rains, with resultant scanty and bad water-supplies both for agriculture and for domestic purposes. In India epidemic cholera is more particularly associated, in normal times, with the movements of millions of pilgrims through the densely populated endemic areas. These pilgrims acquire the infection and distribute it as they go on their way.

Some personal protection against infection can be obtained by prophylactic vaccine inoculation; but this is only temporary, and has to be reinforced by repeated inoculation every few months to maintain the immunity obtained. Equally important in the avoidance of the disease is abstention from all uncooked food or unboiled water or milk, and the seclusion of all foodstuffs from the attentions of the innumerable flies. Water-supplies, apart from the more obvious safeguards against pollution, can be treated with potassium permanganate sufficiently to make them pink—a measure which, when properly and universally applied in rural areas, is held to be a useful check on the spread of the disease.

Treatment of cholera is directed towards the correction of the deficiencies created by it and towards combating the toxæmia resultant on the infection. So far no drug can be regarded as exerting a specific action on the cholera vibrio. Sir Leonard Rogers based his original treatment on an appreciation of the pathology of the disease, and his results were very encouraging in that he reduced the fatality-rate considerably. The aim is to replace the fluid and salts lost in the choleraic diarrhœa, to equilibriate the body temperature, and to neutralise as far as possible the toxins produced by the organisms. Anti-cholera units have been created in India with the necessary personnel and equipment ready to proceed to the epidemic areas when the disease breaks out. Similar units are in existence in the Army in India, and the combined efforts of these authorities should suffice to deal with any situation that may arise in a disciplined European community. In dealing with the more backward and uneducated Indian inhabitants of the densely populated endemic areas problems too numerous to assess arise; but among these religious and social customs at times are formidable obstacles to the employment of scientific knowledge.

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[1] Brennemann, J. J. *Amer. med. Ass.* 1945, 127, 691.

[2] Ratner, B. *Ibid*, p. 692.

[3] Blamontier, P. *Pr. méd.* March 31, 1945, p. 162.

YOUNG NURSES IN TUBERCULOSIS WARDS

SHORTAGE of nursing staff in some institutions is now so acute that at least one isolation hospital—which includes a sanatorium of 36 beds—is frankly advertising in the nursing press[1] for girls of 16 and over. We have heard of more than one case in which girls of 16, and even of 15, were put straight into tuberculosis wards and rapidly acquired the disease. Unfortunately there is no legislation to prevent girls of this age from entering the nursing service, though formerly hospitals customarily refused to accept them below the age of 17½ or 18. Last year the Ministry of Health advised hospitals on the protection of girls undertaking to nurse tuberculous patients.[2] Good arrangements were described for routine examination, including chest radiography, and it was suggested—but not required—that "a Mantoux test (or similar tuberculin test) should be included." Reports still reach us, however, of newly accepted tuberculosis nurses examined neither by Mantoux test nor X rays, taught no precautions whatever before being sent into the wards, left unprovided with masks though exposed to heavy infection (perhaps from ill-disciplined patients in a late stage of tubercle), and snubbed or neglected when their own first symptoms appear. Contrasted with this is the practice in good sanatoriums where supervision of nurses is thorough and responsible, and gives gratifying results, as a recent contribution to our columns shows.[3]

If, in the present nursing crisis, it is really impossible to enforce rejection of very young or vulnerable candidates, the Ministry should ensure that they are supervised and instructed in such a way that they are not exposed to unnecessary risk. If they take the infection despite such precautions, early diagnosis should make it possible to restore them to full health. Any lower order of care than this cannot be justified.

CANCER RECORDS IN CONNECTICUT

THE methods adopted by the Department of Health in the State of Connecticut to facilitate cancer research and encourage early treatment deserve study in this country, particularly now when our new system of recording cases of cancer is under trial. Eleanor J. Macdonald,[4] the research statistician, discusses the survival-rates of people with proved cancer and explains how the figures are obtained. A special effort was made to get a follow-up of all cases of cancer treated in Connecticut since 1935, with the result that many cases of proved cancer were found to be alive and well. It is believed that the records of these patients can be used to teach the general public that cancer is an ordinary disease, dangerous but curable, about which they should know enough to seek medical advice if they need it.

Miss Macdonald's paper, one of several similar publications, may be regarded as cancer propaganda of a simple and satisfactory type. She points out that the crude death-rate from cancer is fairly constant, showing how much remains to be done, but the divergence between the primary hospital admission-rate for cancer and the cancer death-rate is getting steadily wider. In the past the number of deaths from cancer and the number of patients admitted to hospital suffering from cancer were approximately the same in any one year, so, although patients dying were in most cases not those first recorded that year, it seemed that practically all cases of proved cancer died of that disease. Now for a number of years considerably more patients have been admitted [illegible] cancer but the death-rate has not risen [illegible] an increasing number of the cases [illegible] cured or have their life much prolonged. Early treatment remains the obvious method of increasing the survival-rate, and only by the collaboration of everyone concerned, whether in diagnosis, treatment, or education, [illegible] of cancer be inculcated [illegible] ell be adapted to meet the needs of the Regional Cancer [illegible] taking shape in Britain. Beginning [illegible] small meetings and discussion groups [illegible] the local doctor, obtain the interest of lecturer and listener, and this leads to earlier diagnosis. Special clinics in local hospitals, where points are allotted on which claims for payment for the investigation of patients suspected of cancer may be made, form the next link in the chain. Treatment in central hospitals which provide the most modern specialised methods gives to all proved cases the best possible chance of cure; and finally a careful system of follow-up and aftercare provides data for research and ensures that no patient relapses merely from lack of skilled attention.

STUDENTS AS RELIEF WORKERS

LAST week 95 senior medical students left London for Belsen camp, where in teams of 12, under the guidance of experts from the Ministry of Health and the Ministry of Food, they will help in the treatment of the starving. The students, who volunteered in response to an appeal from the Ministry of Health, are drawn from the following London medical schools: St. Bartholomew's, Guy's, King's College Hospital, London, St. Mary's, Middlesex, St. Thomas's, University College Hospital, and Westminster. They are wearing a khaki uniform with the shoulder flashes of the Red Cross and St. John Ambulance, under whose auspices they are travelling. At Belsen there are already six civilian teams in action, five manned by members of the Red Cross and St. John and the sixth by Friends. Each team of 12 men and women is self-supporting, with its own cooking and washing apparatus, stores, and equipment, and to each is attached two ambulances, two trucks, and a 3-ton lorry.

THE MEDICAL REGISTER

THE Medical Register for 1945 appears at a time when doctors and patients are planning the future health services of the country. It sets out clearly the resources that are available. At the end of 1944 it contained the names of 73,646 doctors, more than ever before. But the number of new names added during the year was only 2971 as against 3532 in 1943. The number of registrations in Scotland remained steady, and the number of "colonials" increased, but in England registrations fell by over 300 to 1196 and in Ireland by just under 100 to 307. The rest of the decrease is accounted for by a fall in foreign registrations of over 300. During the war the intake of medical students has been rationed, and in answer to a parliamentary question Mr. Willink stated last week that the number of students entering the medical schools last autumn was the same as in 1943.

A rise in the number of new registrations is therefore not to be expected in the first post-war years.

DR. STEPHEN TAYLOR has been adopted as Labour candidate for Barnet and DR. W. B. J. PEMBERTON as Liberal National candidate for West Bermondsey.

THE Tuberculosis Association will meet at 26, Portland Place, London, W1, on Friday, May 11, at 3.30 PM, when Dr. M. H. Logg and Dr. Josephine Barnes will open a discussion on pregnancy and tuberculosis.

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1. *Nursing Times*, April 7 and 14.
2. Circular 33/44. See *Lancet*, 1944, i, 456.
3. Edwards, P. W., Penman, A. C. *Lancet*, April 7, p. 429.
4. [illegible] *Health Bulletin*, November, 1941.

Special Articles

THE RETURNED PRISONER-OF-WAR

G. C. Pether, M D Lond., M R C P
MAJOR RAMC; MEDICAL SPECIALIST

In the next few years we shall be obliged to consider the medical and social treatment of repatriated prisoners-of-war, both military and civil, and some recollections of a civilian internment camp in 1914–18 may be helpful. The camp in question was a few miles from Berlin and housed British civilians an [illegible]

[illegible]

After his arrest—itself a somewhat alarming process in an enemy country—the prisoner will feel anger, resentment, and apprehension, though later on the fact that he has escaped worse things may modify such feelings. Though the motives for his detention are political, a prisoner-of-war has difficulty in escaping a sense of humiliation due to his domination by the enemy. Experienced observers say that even the best troops, if held captive very long, are thus made useless in action for some time after release, since they bow too readily to the [illegible] To a civilian the discipline [illegible] and [illegible] Other circumstances will contri[illegible] His quarters may be squalid a[illegible] for everything he wants. He may be short of adequate washing facilities, and one may see even a professor of philosophy, waiting in a latrine queue behind twenty other men, weeping under his humiliation. To these stresses are added those of living in close contact with uncongenial companions, and probably before long the discomfort of intense cold and progressive weakness and colic from poor and inadequate food.

IMMEDIATE REACTIONS TO IMPRISONMENT

Many civilian prisoners in Germany were weak from shortage of food early in 1915, quite two years before any general scarcity affected the country. Some were [illegible] 11 ft. square in which six men [illegible] candle was the only light and [illegible] To conserve warmth and [illegible] down on the straw between meals, while others slept only to forget. Later conditions improved, parcels arrived from home, and with returning strength came a greater capacity to face the trials of the day. But the progressive reduction in the quality and quantity of the official rations made itself felt. Bread made partly from [illegible] often caused pain and [illegible] Switzerland by the Re[illegible] way. Though full of mould it had to be eaten, no other being available. Digestive and other ailments were thus common and persisted after release. The very old and the very young seemed to suffer most from abdominal symptoms. Neurotics complain of pain but pain leads to neurosis.

The personal problems of many were difficult or insoluble. It was common for a prisoner to have [illegible]

[illegible] suggested that a long war was unlikely. For this reason little was done at first to organise resistance to the noxious influences to which the prisoners were exposed. But as time passed this optimism gave way to a more grim outlook and comparisons were made with the Napoleonic wars. Rumours of exchange filled the air at irregular intervals, but negotiations, which authority would more mercifully have kept secret, invariably came to nothing, general exchange being refused by the British Government. Cut off from any active participation in his country's war, the prisoner would only console himself with the fact that he indirectly detained about ten Germans in England. His other contributions to the war effort were forms of sabotage. It gave him pleasure to collect his ration of bread, dry it, and burn it secretly to help the blockade. Ingenious persons stole electric current by tapping the wires so as to read under their blankets at night. Others stole coal, lump by lump and day after day. A few attempted escape, but rarely with success. As time passed memory of the outer world weakened and the strength of communal life increased.

Despite the crowded and uncomfortable quarters, each man contrived to surround himself with a few treasured possessions, to remind him of the ties linking him with some place of comfort and sanity, and to protect him somewhat from the irritations around him. Books were slowly acquired, various forms of instruction were organised, and musical and dramatic entertainment was arranged. Games and sports were an agreeable diversion, but at times there was too little energy for the more strenuous activities. The far-sighted began to plan so as to derive some profit from their circumstances and to lesson the injury to their careers. But in such conditions useful mental work was difficult, particularly when the winter drove men indoors. Some attempted too much and broke down, some did nothing and degenerated, most tried to keep within their capacity and slowed down if they felt too much strain.

The attitude of the Germans varied with their fortunes. When victory followed victory they bullied and were arrogant. In times of defeat they were quieter and more moderate. Those who had travelled were conspicuously more agreeable than the rest. Some of the prisoners were only technically British; many had been born in Germany so that a good Berliner named Brown might argue hotly with that fine old Englishman, Schwartz. Friction was thus common and it was aggravated by the certainty that among the prisoners were German secret agents, though none was positively identified. Some of the prisoners had committed indiscretions which if discovered might bring them in front [illegible] our [illegible] his [illegible] Thu[illegible]

It [illegible] were not obliged to work. Release could be obtained if one offered to work outside the camp, but this was generally condemned as helping the enemy, and few went.

MISERY OF LONG CONFINEMENT

In the autumn the swallows flew away to remind one of man's inhumanity to man. In the spring they returned but still the war went on. As time passed eccentricities of behaviour and morality appeared among the prisoners. Suddenly developing and frank insanity caused many to be sent to asylums and some to [illegible]

[illegible] broken beyond repair, often for trivial reasons. Liquor of bad quality, from which an officer on the staff derived some profit, was freely sold and made matters worse. For reasons of high policy various concessions were made and then suddenly withdrawn. Walks of two hours' duration were arranged, each prisoner to have 2½ walks each year. This concession was cancelled so that in four years most of the prisoners were never outside a space about 600 yards long and 200 yards wide. Into this were crowded 4000 men.

By the winter of 1916–17 even the more resolute or those with the greatest resources seemed to be feeling the strain. Despite the measures taken by the Red Cross six weeks might pass without any parcels arriving, particularly during large troop movements. Thus no one could ever be certain whether it was wise to touch his reserves, or go without until the morrow. From this a scheming and calculating habit developed and became ingrained.

The winter was dreaded more and more. The gloom of the stables and lofts where most had to live was increasingly depressing. It became apparent that many were steadily losing ground, both physically and mentally. Insanity was commonly discussed, and it was unpleasant to notice one's friends watching one in a curious way and to realise that one had repeated a question three times after being answered. Some failed to answer when addressed, brooding and introspection having possessed them too long. Further depression and great weakness followed the influenza epidemic in 1918 but the mortality was curiously low—only one death in 1200 cases.

With their rapid advance in March, 1918, the spirits of the Germans rose a little, but there were indications that defeatism and subversive ideas were spreading. After Ludendorff's black day, the pins began to move across the map from left to right and with this the long pent-up feelings of the prisoners found expression. The hatred felt for the enemy, the memory of hardship, and hope of release crowded together in the mind. With the successive hammer blows in the west and successive peace feelers came evidence of increasing social instability in Germany itself. It was rumoured that the mob from the nearby town would rush the camp, seize the food, and perhaps do violence to the prisoners. Unarmed, the prisoners had on several occasions retired to their quarters before machine-guns and bayonets used to overawe them. The situation seemed bleak.

But with the revolution—surely the most orderly in history—it became clear that they would not suffer violence. When the revolutionaries took control they indicated their wish to work out a new way of life for their country. Prisoners were allowed out on pass and many thus saw that strange creature, woman, for the first time in four years. And they came from a setting of ordered and inevitable monotony into a world gone mad.

The period of confusion which followed the armistice did not greatly affect the prisoners. Soon afterwards they were sent home, and, on the journey to the coast, had a passable meal with more meat than they had seen for a year. (In the last eighteen months the ration had been about the quantity found on a man's thumb, once a week.)

RELEASE FROM CAPTIVITY

The sensation of moving as free men was strange and alarming. For so long had the barbed wire confined them that many felt uncertain of themselves if they went more than a short distance from home. Those whose homes had gone had an even greater feeling of insecurity. Attacks of agarophobia troubled many for some years after the war. Others had a subconscious fear of policemen or admitted a desire to carry arms as a safeguard against some vaguely apprehended danger. From moving gradually further and further from his base, and finding that he was not apprehended or attacked, an ex-prisoner gradually regained confidence. After a time he would roam for miles, coming back exhausted and completely happy.

It is doubtful if many could explain their eccentricities either to themselves or to other people. Some of the younger men, while still in this difficult stage of adaptation, were sent by their parents into businesses or educational institutions, in which they inevitably made a poor showing. Family friction resulted and there were other causes for this. Many who had come from Germany conversed easily about matters of importance to Central Europe, culled from the German press. Astonished and perplexed relatives were enlightened about complex frontier problems in places hitherto unknown, while the returned prisoner was regaled with stories of ration cards, Zeppelin raids, and the sale of work at the vicarage. To make the situation more difficult he found that the war experiences of his few surviving men friends were quite unlike his own. And curiously enough his cousin, who had been in the gunners at the front, knew nothing about the Russian advance on Lemberg. So the ex-prisoner felt cut off from his race and generation, an object of mild pity, or even of indifference or contempt. The more sensitive were humiliated by the thought that they had been unable to fight for their country.

The youngest men were untrained to any profitable activity and in the shelter of a camp had not developed the drive and aggressiveness which many Service men had acquired. Rather did their experience make them feel unable to face the rough and tumble and lead them to choose a setting, as in institutional life, where they could feel some protection, comradeship, and sympathy.

In the sphere of sex relationships difficulties arose from exaggerated feelings of fear and guilt resulting [illegible] humiliations of prison life.

The physical condition of many was very poor indeed. Attempts to eat ordinary food caused violent upsets and some could not eat anything but bread and butter for weeks after returning home. The bowels acted freely on the slig[illegible] ye organic disease was sometimes [illegible] for some time after release by [illegible] symptoms caused by bad food.

The official machinery devised for dealing with returned prisoners was clumsy, cruel, and even dishonest. Within a short time of their return many prisoners were being pressed to repay the Government the paltry sums advanced to help them survive. It is shameful to read that this is again being done in this war. Civilians were excluded from the scheme of trai[illegible] benefited ex-Service men. In the [illegible] there was no scheme of any kind. [illegible] war many civilians, broken in health and vainly trying to recover their reparations, were a burden to themselves and their relatives. The indifference of the Government to these matters caused bitter resentment. Many public men in Church and State had promised their interest and support, but few fulfilled their promises. The Red Cross and other organisations gave what help they could.

These facts explain the persistence of certain phenomena in the returned prisoner. Though he has been in the power of his enemy, against whom most of his resentment is directed, the ex-prisoner easily transfers this resentment to any persons or organisations who seem to have contributed to his misfortune. There is thus justification for stressing the feeling of betrayal and abandonment which, in the last twenty-five years, have been felt by many of our nationals in foreign countries. The policy of the Foreign Office, they say, was "Englishmen last," and where prisoners are concerned any suspicion that the country is indifferent to their fate will engender much bitterness.

In the treatment of returned prisoners a rigid and automatic machinery is undesirable, but full medical, educational, and social aid should be at their disposal. The aim must be to build up the patient's confidence and strength, deal with any discoverable disease, and make him feel once again that he "belongs." This will be facilitated by rejecting any suggestion that it is shameful to be a prisoner-of-war, or that if he had really tried he could have escaped. The prisoner will require of his womenfolk more than usual insight and intelligence. He is likely to be afraid of them and to conceal his vaguely apprehended fears of other things, lest he be branded inept both in love and in war. The terrors of the field of battle may seem no more real in after years than the dull misery of the soup queue waiting in the snow on a dark and windy night.

SUMMARY

Prisoners-of-war, both civil and military, like criminals under restraint are exposed to conditions which induce humiliation.

Feeding, accommodation, and medical treatment are likely to be poor, so a prisoner's capacity for resistance is lessened. His physical and mental health is likely to be impaired both during and after his captivity.

Since the reasons for their detention are political, prisoners-of-war will feel they have suffered for their country. Some official recognition of this fact is expected and should be given.

The machinery for dealing with the civilian prisoners-of-war of 1914–18 after their release was inadequate and its direction mean and clumsy.

Their problems can only be solved by medical measures associated with political action.

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EUGENICS SOCIETY.—On Tuesday, May 29, at 5 PM, at the rooms of the Royal Society, Burlington House, Piccadilly, London, W1, Mr. Cyril Bibby will speak on sex education—aims, possibilities, and plans.

In England Now

A Running Commentary by Peripatetic Correspondents

I WAS about 100 yards from where "one of them things" fell. There was a terrific crash, the building rocked as if some giant was holding and shaking it—as an American officer put it, "it was like a terrier shaking a rat." Then a long rumble, and the sound of falling glass. It was not at all terrifying; there was no temptation to duck or to dive, and I remember watching the windows and wondering whether they would cave in. The curtains blew open, dust filled the room, and my little lad standing next to me got a fright. I've been quite near a number of these rockets, and "psychologically" they are not a formidable weapon. They leave none of the quivering and heart-thumping of the usual "near miss": one feels that this is a fluke shot—you don't anticipate any more—and of course there has been no preliminary period of strain. Women certainly found the flying bomb, with its wait-for-it effect, far more trying; its repeated drone was eerie and uncanny, and made you think, "I may not be lucky this time."

When the rocket fell I was standing in my dressing-gown, and it took me four or five minutes, at the most, to get some clothes on and slip downstairs. There wasn't the slightest sign of pandemonium or even excitement. People were walking about calmly and looked almost unmoved. The pavements and streets were littered with glass fragments, and I crunched along through them towards the incident. I walked, for I remembered a policeman telling me, in my student days, "My boy, never run to an accident, you'll be out of breath when you get there and be no good." Buses and taxis were driving unconcernedly over the glass, and the traffic was continuing as before. I even noticed the newspaper man at the corner sweeping the glass off the pavement into the gutter in a matter of fact sort of way. The windows and their frames lay shattered and tumbled in, and I expected to see scores of people with jagged lacerations. But I never saw a single person cut.

Fire-engine and ambulance bells were clanging as they dashed towards the scene of the incident. I was one of the first, and certainly seemed to be the only doctor, on the spot. But an incident officer was already there, and several ambulances were gathering the injured. Quite calmly, with a loud speaker, the officer was ordering the public away from the scene. It struck me at the time that a loud speaker might with advantage be attached to all accident ambulances in future. I reported to the officer, and as I looked around where to attend I noticed people—even little children—picking up bits of the rocket as souvenirs. The rocket had fallen in an area where enormous casualties might have been expected; but there were very few. Certainly no obvious dead were lying about, and it is no secret that only 3 people subsequently died from injuries received. I [illegible] "the injured was [illegible] n American amt [illegible] ricans are I Time and again I have seen them first on the scene and lending a hand.) There was no red tape about getting permission and so on to attend. The man in the ambulance happened to be a soldier; his face was slate grey, with parted agonal lips, and his hands hung limply over the side. They felt icily cold and with no pulse. His trousers were soaked in blood, and as one ripped them open with a jack knife it became clear that the blood was coming from a relatively small wound over the common femoral artery. The bleeding was now only a slight trickle. Obviously he needed blood urgently—very urgently; life was a matter of minutes. There was very little I could do; one couldn't even tip the stretcher into the Trendelenburg position, and I always think that important in such an emergency. I sent him off in the ambulance, and later heard that he died on the way. Then I attended to a young airman with a fragment through his tibia; his pulse was quite slow, he was utterly calm, smoking a cigarette, even grinning, and not at all worried by it. Near him a little dead bird lay on the ground. It caught my eye as I bandaged his leg—just one of the [illegible]

By now 6 or 8 other injure[illegible] there was a ring of ambulanc[illegible] was well organised. I was struck by the fact that only one girl needed attention because of fainting; and in her case it was reasonable, for she had seen her young man rather severely injured. The bomb had struck a large water pipe, and water was pouring forth into the gutters, but within this short time a man had arrived with a large key to turn off the water. The NFS men were there in full force searching the neighbouring buildings for injured; the military police, with an officer in charge, had taken up their positions; and wardens were receiving instructions from the incident officer. Within 15 minutes of the incident there was thus a fully established organisation which told relatives and other inquirers the names of the injured taken to hospital, and broadcast information on what to do if you were bombed out and how to stake claims for bomb damage. Two hours lat[illegible] workmen were hard at wor[illegible] [illegible] them the windows and [illegible] avements had been swept. [illegible] bomb crater had been drained dry, and what's more, passers-by with morbid curiosity could even have a look at it—rather a good thing that, because they could see that it wasn't quite as horrible as they had pictured it.

I must say I felt there was room for improvement as regards surgical first-aid. There is not much point in rushing a man into an ambulance, only to deliver him dead at the other end. With a shocked patient "this [illegible] journey will [illegible] be equipped [illegible] used on the [illegible] to hospital. The American orderly wasn't far wrong when he said as we were attending the man with the femoral artery injury, "Say Doc, if we had some plasma we could sure do this man some good." In 1945 death from hæmorrhage from a limb vessel should be avoided. But in this war we doctors have been teaching more and more, "get the patient to hospital." That is usually good advice, but this incident seemed to suggest that there is much to be said for the American custom of having a doctor attached to the accident ambulance. Then, our ambulances need redesigning. One should be able to tip the stretcher into the Trendelenburg position, warm the patient electrically, and even do a tracheotomy; the Birmingham Accident Hospital have set a fine lead in such ambulance design. Our ambulances don't even carry sterile dressings; it would be the easiest thing to have large dressings in 'Cellophane' ready to be used as required. Those stupid little gauze bandages, almost from Crimea days, seem to be about the only equipment. Lastly, to get to the bleeding point the clothes need to be ripped up, and that needs a jolly good pair of scissors. These are very scarce and the usual dressing scissors is a poor thing. One fireman handed me such a pair, and he was obviously a wise fellow, for he had attached a long piece of string to them which was tied to his wrist and ensured that the scissors were returned to the owner.

* * *

It is nice after 3 years of tent-dwelling to sink back comfortably into this splendid convent school in the best end of Belgium. It has been cleared of little girls, but the *bonnes sœurs* still inhabit that portion beyond the pale. We see them from our upper windows walking decorously round their herb garden on fine evenings. Reliable observers report that some of them have been seen to do so backwards—presumably to expiate some venial sin. Our only official contact is in the kitchen which we share with them. They are good and imaginative cooks, and it is thought that any student of the *marché noir* might learn something to his advantage were he to compile the dossier of the deliveries which arrive daily at their back door.

The only real ripple on the placid waters of our extra-professional life has been the ghost. At the end of our first month here the night staff started to see it; and then to describe it—"An unhappy girl of 14 with pigtails, who just looks at you . . .", until alarm and despondency reached the level at which something had to be done. Inspiration led the CO to request our [illegible] padre to exorcise it; and those of us who only kn[illegible] ceremony of Bell, Book, and Candle through th[illegible] tures of the Jackdaw of Rheims settled bac[illegible] expectation. The Father bustled round interviewing eye-witnesses to satisfy the statutory requirements, but we soon began to hear with regret that this evidence was proving insufficient. The medical specialist thereupon took it on himself to ensure that a convincing case should be presented. His sudden unusual activity and known predilection for whimsy however apparently sowed the seeds of doubt in the good Father's mind, and prematurely, as we thought, the party was called off. It may not have been judgment from the "highest level," but the medical specialist did leave us for the Burma Road shortly after. Also the ghost has not been seen again.

We have an extensive garden, and everywhere there is cherry blossom. This has served as the basis for a scientific test for the arrival of spring in Belgium which deserves wider publicity. The scent of the blossom is titrated against that of the human manure with which the inhabitants so liberally cover their country at this time of the year, and when the former just covers the latter—spring is here. It is quite a sharp end-point.

We hope that the Powers will allow us to stay here for a bit, for it would seem from those returning from the forward areas that life in the occupying army is unlikely to be a really restful experience for some time to come.

* * *

"Someone," exclaimed a Lancashire worthy, "someone ought to be summonsed." At any rate, the medical advisers to the War House have much to answer for. Here are hundreds of soldiers who have been abroad for 2½ years. They have been magnanimously granted a week's leave. No grousing about that, but this is the point: the dates on which the chaps go home have been decided *by ballot.* Could anything be more fantastic? A schoolboy at puberty would have displayed a more realistic acquaintance with elementary physiology. *Short* leave for a soldier is a matter in which his wife is directly concerned. Already the wives' letters are arriving in which disappointment is expressed over leave dates, and their disappointment will later give place to frustration. Unless it is the Government's avowed intention to keep the birth-rate down, an order is urgently necessary which would permit a soldier to defer his leave for a number of days, thus safeguarding marital relations during an all too brief reunion.

* * *

The Greek mother had carried her child from the village over the mountains, five hours away, and in the middle of the morning she knocked at my door and asked if I would see her. I went outside and saw her lying on the ground—pale, frightened, thin, and obviously very ill. Over one leg was a filthy rag, round which the flies were buzzing. Taking it off, I saw what remained of her leg—a horrible sight that made me wince, when horrible sights were common. The whole foot and part of the leg had gone, and the bones extruded from a gangrenous and septic mass of tissue. How had it happened? Ten days before, from a snake-bite; the usual ineffective treatment had been given—some leaf or other put over it, or perhaps an onion—and only now had it been considered serious enough to bring to me. I could not restrain my anger with the parents, but we did the only thing possible to save her life—an amputation. In due course she got over it, but she was taken away from the hospital before she was really healed. I had moments of great doubt before we operated, and I still have. Was it the best thing to send this poor creature back into a community where wives are sought for their ability to carry out all the hard work that has to be done if the family is to survive in a land desperately poor and ravaged by the enemy; where poverty is so extreme that it is a question of survival of the fittest; where no one can be supported all their life as a burden; and where there are none of the compensatory outlets for energy and interests which make a cripple's lot in England bearable?

* * *

Examining a man who is going to Germany as a catering expert, I found out how he cooked greens: "Always start in cold water with the lid off." He has been cook at various hospitals, including one for children, and is proud of his efforts to protect his clients from faddists, thereby saving food: for he is sure nobody would eat vegetables cooked as the Ministry of Food recommends. Unfortunately I could find no reason for marking him unfit; I can only hope he is going to cook for Germans.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

IN former days of peace the opening of the Budget was usually a first-class political occasion. In time of war, Budgets follow circumstance, and MPs are in the grip of events: we do what we must, and that is why it is so much easier for parties with different policies to agree.

Budget day 1945 was very quiet. Someone said there was no more excitement than at a mothers' meeting. This despite the fact that the Chancellor of the Exchequer was, for the first time in the war, able to indicate a substantial probable fall in expenditure. The fact that there is to be another Budget in the autumn does not indicate the likelihood of many concessions in the way of tax reduction. It only underlines the fact that there are so many unknown factors at present that exact estimates are not possible. That there will be tax reduction sometime is likely; but when and how is another matter.

The condition of Europe revealed by the grim unveiling process of the advance of armoured columns shows a condition of physical destruction and (in respect of some commodities) destitution which threatens not only European but world economic order. The march out of Germany of the many hundreds of thousands of slave workers, deportees, and war prisoners is throwing an almost impossible strain on administrative machinery and a very severe strain on immediately necessary supply. And the revolution has not yet reached its end.

The clamour to reduce the rations of German prisoners, which arises from the spectacle of food shortages for civilians, is a very natural but unthinking reaction. To give way to this clamour—which the Secretary of State for War shows no signs of doing—would be to increase the general depreciation and to abandon one of the last remnants of international organisation, the Geneva Red Cross Convention, which is the safeguard that has stood between our own British prisoners-of-war and the horrors of the Nazi concentration camps.

The House had a nasty jar when the Minister of Fuel and Power announced the severe restrictions on fuel consumption which have to be imposed. Here is another scarcity and restriction which links us to continental Europe. And politically the older parties—Labour, Conservative, and Liberal alike—had a shock when the 6000 majority for a Commonwealth candidature at Chelmsford followed the victory recently of a Scottish Nationalist at Motherwell. It is clear the country wants a new deal. The oscillation of opinion at by-elections is always greater than at a General Election. But the new House, when it is elected, will have many new faces.

FROM THE PRESS GALLERY

Negotiations on a National Health Service

ON the motion for the adjournment, Dr. EDITH SUMMERSKILL raised the question of the discussions about the National Health Service which had taken place since the parliamentary debates on the white-paper. The principles of the white-paper had been very carefully discussed before it was presented. If it was intended to change those principles, then the Government should produce another white-paper so that the House could discuss it. A document marked "not for publication" had been circulated to over 70,000 doctors. The time had come when she felt able to reveal the contents of the document, because newspapers, medical publications, and leaflets of all kinds had been published giving details not only to doctors but to the public. It revealed a complete change in the attitude of the Government towards the new health services. In regard to the health centres, for example, it was suggested in the new proposals that there should be only a few experimental health centres, that the local authorities should have no clinical supervision, that the doctors should go and work there but their work would not be supervised, that the only contact between the doctor and the local authority would be that of landlord and tenant. The employment of doctors on a full salaried basis in health centres, to which some had looked forward, had all gone. There was a suggestion that there would be some part-time service, but otherwise doctors were to be paid on a per-capita basis. The document could be summed up by saying that instead of the great reform welcomed last year the Minister was proposing to the BMA that they should have an extension of what was known as the panel system. The Minister of Health had said: "I cannot tell the House what proposals there are, when there are as yet no proposals." Yet in the first paragraph of its document the BMA council spoke of "an administrative structure put forward by the Minister as a possible alternative to that outlined in the white-paper. They are proposals which the Minister will be willing to put to his colleagues as soon as he knows whether they commend themselves to the medical profession." Was the Minister repudiating this?

Mr. H. Grinstead could not understand why the Minister's negotiations should be stigmatised as improper or subversive of the authority of the House. Those who wanted to see a National Health Service brought into operation should surely be grateful to him for having undertaken these long and difficult negotiations to try and make the proposals more acceptable to the House as a whole. Dr. Summerskill had regretted the disappearance of the salaried doctor, but those on the opposite side of the House regarded the civil-servant doctor as one of the big flaws in the original proposals. They did not want to see the doctor in the Civil Service or the patient in the pigeon-hole. The House was in no way committed to the white-paper by the simple terms of the resolution passed in March last year, and it was a travesty of the fact to present these changes as defying the decision to which the House then came.

Mr. S. Storey said that Dr. Summerskill had put a most mischievous view of the situation before the House. The Minister had taken the common-sense course to improve the white-paper proposals. If sound proposals were wanted they must let those who could offer constructive criticism get round the table and discuss the matter with the Minister.

Mr. Willink, Minister of Health, in his reply, asserted hat no member of the medical profession had disclosed o him the document to which Dr. Summerskill had been eferring and which she had thought right to disclose to he whole public. In the white paper the hope had been xpressed that it would serve as a focus for detailed discussion. That was the discussion that had since been and

nodification. The time had come when the spokesmen of the interested bodies desired to report on the progress of the discussions. But there were no "proposals." The Secretary of State for Scotland and himself had not yet reached a stage in the discussions when they could put the whole thing together to place before their coleagu

had

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posals, and he could take no responsibility for the terms of what Dr. Summerskill had read out which he had not seen himself.

Dr. Summerskill.—Am I to understand that this is completely unauthorised, that these doctors should not have been called to this meeting next week believing that the Minister was willing to put to his colleagues these proposals if they commend themselves to the medical profession?

Mr. Willink.—It is clear that in the endeavour to reach the general agreement contemplated in the white-paper it is necessary, at a certain stage, to discover what can be agreed. I can take no responsibility for the contents of the document which I have not seen and which was not intended for my eyes. It was a confidential document, not for publication, circulated to members of the BMA and other members of the profession

In a further reply to Mr. A. Walkden, Mr. Willink said that, although it had nothing to do with him, he considered it most unfortunate that the document had been published in the middle of these most important discussions.

QUESTION TIME

Pneumoconiosis Research Centre

Mr. J. Griffiths asked the Minister of Fuel and Power if he had any statement to make concerning the progress of the effort

coalminer

report of

ments have been made between my ministry and the Medical Research Council for further investigations into the cause, prevention, and treatment of pneumoconiosis. The council in conjunction with my ministry have undertaken to establish and maintain a research centre in South Wales, and have appointed Dr. C. M. Fletcher to direct the work. He will take up his duties on June 1, 1945, and it is hoped to provide a small number of beds at a selected hospital. Additional physical and chemical investigations and reports will be made by HM inspectors of mines and other members of my staff. A joint committee of the ministry and the council has been appointed to assist in the development and coördination of the whole scheme of research.

Replying to another question Major Lloyd George stated that the number of new cases of silicosis and pneumoconiosis certified by the Silicosis Medical Board for total disablement

iese diseases,

83, and that

also issued

by the board.

Intake of Medical Students

Mr. D. L. Lipson asked the Minister of Health whether the number of admissions of medical students at the teaching hospitals this autumn would be substantially larger than the average for pre-war years, in view of the need for more doctors under any national health scheme.—Mr. Willink replied that the average figure for the three years before the war was 1462, including 226 women, and the admissions for the present academic year were also 1462, including 374 women. It was not possible to increase automatically or readily the numbers in medical schools. There was great difficulty in obtaining staff, but they were doing all they could.

Mr. Lipson asked if the Minister would give further consideration to making use of public hospitals to enable would-be women medical students who have been refused admission to the teaching hospitals this autumn to obtain medical training.—Mr. Willink told him that that was being considered. Dr. Summerskill asked if the Ministry intended to ignore the demands of women medical students who were asking for accommodation in hospitals; and in view of the fact that there was a shortage of doctors, if he intended to treat these students as redundant labour. Mr. Willink.—I am not ignoring any demand, but I cannot accede to a demand for medical teaching when the teachers are not there.

Permanent Appointments

Sir A. Southby asked the Minister of Health whether he could give an undertaking that, except in cases where the circumstances rendered it imperative, permanent appointments on the staffs of hospitals under his department, or any health services of the country, would not be made so long as medical officers now serving in the Forces were not in a position to compete for such appointments on terms equal to those enjoyed by medical practitioners who were not serving in the Forces.—Mr. Willink replied: So far as concerns medical appointments within the sphere of my department, the policy of approving such appointments only on a temporary basis under present conditions is being closely observed. Sir A. Southby asked the Minister to look carefully into the matter, because it is believed that a certain number of appointments have been made to the exclusion of the possibility of competition from officers now serving. Mr. W. H. Guy said there was widespread dissatisfaction among those serving in the Forces regarding two recent appointments of medical officers at Cambridge and Aberdeen mental hospitals

Civilian Duties at Home and Abroad

Captain L. F. Plugge asked the Minister of Health whether he had considered the protest by the Chatham borough council against the possible calling up of Dr. J. C. Sleigh, their MOH, for civilian duties attached to the RAMC; and, in view of the shortage of doctors in the district and the urgency of the matter, what action he proposed to take.

Mr. Willink replied: This matter has been fully considered in consultation with the Central Medical War C mittee, who have recommended that Dr. Sleigh be called up. The need for officers experienced in public health and hygiene for the Civil Affairs Branch of the RAMC is pressing and, though some sacrifice of services or of standards may be unavoidable, I am advised that alternative arrangements for carrying on Dr. Sleigh's work can be made. I regret that in these circumstances I cannot oppose Dr. Sleigh's recruitment.

Captain PLUGGE said there was very high infantile mortality in the Medway towns, and asked if the health of British children should not come before the health of German civilians, who had always done what they could to suppress life instead of saving it.—Mr. WILLINK replied that this was not merely a case of the health of German civilians. The borough of which Dr. Sleigh was medical officer was one of three towns which were extremely close together—Chatham, Gillingham, and Rochester. There, the assistant medical officers would be reduced from six to five by this action, and the question which Captain Plugge had raised would not really be affected.

Tuberculin-tested Milk for Expectant Mothers

Mr. W. J. BROWN asked the Minister of Food whether facilities were provided for the supply of tuberculin-tested milk, when desired, for expectant mothers.—Mr. TOM WILLIAMS replied that an expectant mother may obtain tuberculin-tested milk from her retailer provided that the retailer is able to provide milk of this quality. Supplies of tuberculin-tested milk are limited, and it is not always possible to supply a particular retailer with this type of milk for those of his registered customers who desire it.

Panel Practice

Regional Medical Officers Again

THE Insurance Regional Medical Service is shortly to be restored on a restricted s[illegible] Wales. Shortage of staff will make it [illegible] the same volume of references as before the war or to hold sessions at some towns in the more sparsely populated parts of the country where they were previously held. Doctors will not be able to refer cases for advice on diagnosis, and approved societies have been informed that they should not refer more than about half the number of cases referred per month during 1938. Doctors may refer cases on the question of incapacity, but for the time being it will not be possible to deal with references relating solely to a woman's fitness to do her ordinary housework. A list of towns where it is proposed to hold sessions is being issued, and patients should not ordinarily be referred if they live more than 25 miles from the nearest town on the list. It is hoped before long to extend the service to cover the whole country. Doctors should send their references to the divisional medical officer of the division in which the insured person is living, the addresses being as follows:

North-eastern.—Century House, South Parade, Leeds 1. (Leeds 30464.)

North-western.—The Baptist College, Brighton Grove, Manchester 14. (Rusholme 3248.)

South-eastern, and South-western.—Queen Anne's Chambers, 28, Broadway, Westminster, SW1. (Whitehall 7010.)

In Scotland the Regional Medical Service has not been suspended during the war, and it is hoped that with the gradual release of regional medical officers from war-time duties it will be possible to examine a larger number of cases, to undertake a greater number of home visits, and eventually to reinstitute the special reports on cases where incapacity continues beyond a specified period. The Scottish service will, as heretofore, provide diagnostic and consultant facilities where necessary for cases referred by insurance practitioners.

The insurance side of National Health Insurance is now administered by the Minister of National Insurance, but the administration of medical benefit remains under the control of the Minister of Health.

ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS.—At a meeting to be held on Saturday, June 9, at the London School of Hygiene, Keppel Street, WC1, at 2.30 PM, Mr. S H. Wilkes, FRIC, senior chemical inspector of factories, will speak on pro[illegible]on against industrial poisoning

Letters to the Editor

THE MEDICAL SUPERINTENDENT

SIR,—Ever since the Local Government Act, 1929 came into operation, which, amongst other things, transferred the poor-law infirmaries and institutions to the county councils and county boroughs, there has been quite a spate of controversy as to whether the administrative head of the transferred infirmaries should be a medical superintendent or a layman.

The provisional proposals of the Minister of Health as outlined in the white-paper have served still further to stimulate discussion on this subject, because, again amongst other things, these proposals envisage the development of regional areas for hospital purposes and within the regional area a much closer coöperation between voluntary hospitals and municipal hospitals than has hitherto existed. Inasmuch as in voluntary hospitals, generally speaking, the administrative officer [illegible] reas in municipal hospitals he is [illegible] a medical man, it is not surprising that the relative merits of these two methods of hospital administration have engaged a good deal of discussion and marked differences of opinion. In these circumstances, perhaps I may be allowed to contribute a few observations based upon more than forty years of practical experience of both methods of administration

First and foremost, it is quite a mistake to start with the assumption, as so many people do, that a medical man, as such, is incapable of being a good administrator, because, as it is so often said, his training as a medical undergraduate and/or his experience as a graduate tends to unfit him for administrative work. Similarly I strongly protest against the all too commonly expressed opinion that a layman, as such, has any special and distinctive claims to administrative ability.

The truth is that administrative capacity is an inborn gift, pure and simple, like many other gifts with which we are all familiar—e.g., mechanical, financial, or artistic—and that given a "flair" for administration and organisation, the only other thing which makes a good administrator is the seizing of every opportunity to obtain practical experience and variety of administrative problems. Then it does not matter whether your profession is the Church, Law, Education, or Big Business: you become a successful administrator because you have the gift for the work and have taken every opportunity for developing it over a wide and varied field. In this connexion it must surely be the experience of everyone who has attained middle age to be able to recall to mind many examples of extremely able administrators in the Church, Law, Education, and other learned professions; and, if so, why not the medical profession?

The second point which my experience has taught me is that if I had to decide between two men of equal administrative ability for the responsible post of chief administrative officer of a hospital or a regional hospital organisation, one of whom was a layman and the other a medical man, I am confident that it would be a wise choice to appoint the medical man, because the additional qualification of a medical training would give him an overwhelming advantage and make him the better administrator of the two candidates. I do not for one moment overlook the fact that there are many other important considerations which determine successful administration—e.g., tact, diplomacy, ability to cooperate harmoniously with one's colleagues, medical and lay, personality, &c.—but these are equally important qualifications whether the candidate is a medical man or a layman and are therefore regarded as common to both.

The third point deserving careful consideration in connexion with hospital administration is one which is frequently put forward as a strong argument against the appointment of medical administrators—viz., that a medical superintendent cannot simultaneously combine successfully or efficiently the dual function of administration and clinical responsibility for the care of the patients and the work of the hospital medical staff. The answer to this argument is that it depends upon (*a*) the size of the hospital, (*b*) the nature of the work undertaken, (*c*) the quality of the medical staff provided for the work of the hospital, and (*d*) the medical superintendent himself.

The simplest and best example I can think of is the hospital for infectious diseases, where the administrative head is almost invariably the medical superintendent. I have had considerable experience of this type of hospital both in London and the provincial counties, and I have no hesitation in saying that every one of the medical superintendents of such hospitals that I can remember in my time have been conspicuous examples of first-class administrative and clinical ability, and that it would be quite impossible for any other system or method of administration to produce more efficient results.

I am, however, prepared to go further and to state that equally good results have been obtained by the same combination of administrative and clinical ability in other types of special hospitals—e.g., mental, orthopædic, sanatoria, and children's hospitals—and in order not to confine the examples to municipal hospitals, let me quote the case of the late Sir Henry Gauvain, medical superintendent of Lord Mayor Treloar's world-famous orthopædic hospital at Alton, who most certainly was a supreme example of administrative and clinical ability.

It may however be argued by some that even if it is conceded that there may be particular considerations which apply to special hospitals, the position in the case of general hospitals is quite different. Here again my answer would be that one comes back fundamentally to those same four considerations already mentioned—with one possible modification. In municipal general hospitals of say 300–400 beds I have often seen most excellent work done by medical superintendents who have combined in themselves both the administrative work and a substantial proportion of the actual clinical work of the hospital. On the other hand, it must be obvious that the larger the hospital the greater the demand on the time and energy of the medical superintendent for the administrative work, and in those instances of which I have personal experience where the bed accommodation is of the order of 800–1000 or even more beds I do not think that there can be any medical superintendent nowadays who would attempt to exercise personal responsibility for the treatment of patients or the close supervision of the work of the junior medical staff. In these large municipal general hospitals the arrangements for providing medical staff, equipment, and essential special departments, such as radiology and laboratory work, are entirely changed and enormously improved since the days of the old poor-law infirmaries—i.e., prior to the year 1930. Therefore it is quite a mistake to imagine, as so many people do even nowadays, that the medical superintendent of a large municipal general hospital interferes with the work of the clinical staff and generally makes himself a nuisance. There are bound to be some fools in the municipal hospital organisation throughout England and Wales, in the same way as there most certainly are in the voluntary hospital organisation; but such examples have become few and far between during the last 15 years owing to the rapid retirement of the old poor-law medical staff, the gradual introduction of the younger and more modern-minded medical staff to positions of responsibility in the municipal hospital service, the greatly improved terms and conditions of service both for the medical and nursing staff, and (perhaps most important) the introduction of a large element of consultant medical and surgical staff into the municipal hospital service.

For these and other reasons, which considerations of space alone prevent me from detailing, I am still of the opinion that, on the whole, other things being equal, there is a definite advantage in the appointment of medical men, possessing suitable qualifications, as the chief administrative officers of hospitals. Personally, I think this is the case particularly in municipal hospitals, but I am not so convinced that it is equally true in the voluntary hospitals mainly because of their traditional practice to appoint laymen, and because their financial circumstances bring into consideration certain other essential qualifications in the appointment of laymen as house governors or secretaries which do not apply to municipal hospitals. Nevertheless it is an interesting fact that one of the best known of our medical school hospitals—namely, Guy's—has for many years past appointed as its chief administrative officer a resident medical superintendent, of whom the late Sir Cooper Perry (a dermatologist), Sir Herbert Eason (an ophthalmic surgeon), and Prof. T. B. Johnston (an anatomist) are conspicuous examples of administrative ability with diverse interests in other branches of medical science.

Similarly I would remind your readers of the position in naval, military, and Air Force hospitals, and Ministry of Pensions hospitals, and of the latest example of all, the chief medical officer of the Emergency Hospital Service which is presided over by Sir Francis Fraser who up to the outbreak of war was a whole-time professor of medicine.

Bronnant, Criccieth, North Wales. FREDERICK MENZIES.

A NATIONAL HEALTH SERVICE

SIR,—I have turned back to Beveridge and must confess that when he says "there will be nothing for which people can be asked to contribute voluntarily" he does, as you say, mean people who contribute to hospitals by way of insurance and not from philanthropy, though I doubt if the voluntary hospitals agree with you that "their position would be stabilised if the new proposals are accepted."

But Beveridge on certificates is quite another matter. You will agree that in para. 437 he says "The primary interest of the . in finding a health servic . . *and will ensure the care* ol payment of benefit at the rate proposed in this report." This "careful certification" is clearly distinguished from existing certification, or why seek a health service to ensure it? How can a health service "ensure" it save by directing and controlling the certifiers, and where would be the use of doing this if certificates from outside the service were to carry equal authority?

That they need not carry equal authority is already but too clear. Class 1 (g) in the milk priority list, dated November, 1941, is: "Cases of pleurisy . . . in which there are reasonable grounds *in the opinion of the Tuberculosis Officer* for suspecting that the condition is tuberculous. In such cases the medical certificate is only valid if signed by the Tuberculosis Officer." What further need have we of witnesses? And, alas, this discrimination against the certificate with no gilt edge has not been strenuously or successfully opposed by the medical profession.

London, NW3. LINDSEY W. BATTEN.

MILK TESTING FOR TUBERCLE BACILLI

SIR,—I should like to point out some words in your leading article on Milk Policy (April 21) which may create a false impression. The words were taken from a speech by the Duke of Norfolk, who represented the

to is for keeping quality only—and even so is more biochemical than bacteriological. There is in fact no testing at all under that scheme for pathogenic organisms, and very little by local authorities,

action is so limited. A m

a milk-supply believed t

scarlet fever, but not with tubercle or undulant fever even if it has been proved to be infected. And as you so rightly pointed out, almost all bulked milk is so infected.

Ministry of Health, London, SW1. W. A. LETHEM.

HEARING-AIDS

SIR,—Considerable interest has been aroused by the recent discussion in the House of Lords concerning cheaper hearing-aids, and I should like to be allowed to record the following facts. Four committees are in existence, namely:—

(1) The medical committee of the National Institute for the Deaf (protection of the deaf public against inefficient aids and unethical suppliers).

(2) The electro-acoustic research committee of the Medical Research Council (fundamental research into electro-acoustic problems).

(3) A committee of the British Standards Institution (calibration and standardisation of audiometers). This is quiescent at the moment.

(4) The technical committee of the Hearing Aid Manufacturers Association. This is in three sections: (*a*) utility aid and general standardisation; (*b*) audiometers and hearing tests; and (*c*) technical education for the staff.

As president of the Hearing Aid Manufacturers Association, I am privileged to attend meetings of the medical committee of the National Institute for the Deaf. The secretary of the institute attends most meetings of the association. The latter is now represented on the committee of the British Standards Institution. There is as yet no official contact between the electro-acoustic research committee of the Medical Research Council and the technical committee of the Hearing Aid Manufacturers Association. The former committee is, however, fully informed of the work of the latter, and closer coöperation may result.

Any hearing-aid manufacturer whose instruments meet with the approval of the medical committee of the National Institute for the Deaf, and who agrees to give home trials, of at least a week, before selling an instrument (to avoid door-to-door touting and other undignified practices) is put on the National Institute for the Deaf list. Unfortunately many deaf persons are unaware of the existence of the approved list, and its significance.

From 1934 to the outbreak of war the British hearing-aid manufacturers, with the help of British valve-makers, led the world in the design and production of pocket valve amplifiers. British valve aids were exported to most foreign countries, and they were smaller and more efficient than anything available elsewhere. Since the war, members of our association have had a tremendous struggle to keep their instruments in operation, and to supply the users with adequate battery and other replacements. Encouraged by the National Institute for the Deaf, we produced the specification of a "pooled" utility three-valve pocket aid which we were hoping to produce during the war to sell at a price around £10. We have been unable, however, to obtain supplies of valves, components, and batteries over and above our existing very small allocation to make the manufacture of these utility aids possible up to the present time.

From the returns made to the Board of Trade, it can be stated that the number of valve amplifier hearing-aids in use in this country is under 50,000. The total figure of deaf people who could be helped by valve aids is undoubtedly higher, but it includes many who obstinately refuse to wear an aid. It is certain that among the potential users, there are very few indeed who remain without an instrument because they cannot afford it. Before the war our members supplied robust and reliable valve aids at list prices from 8 guineas, which operated on standard batteries with a maintenance cost amounting to only about 6*d*. per week. Hospital clinics help patients to obtain aids at substantially reduced prices, and many approved societies give grants towards purchase. Deafened ex-Service men are given aids free of charge by the Ministry of Pensions, with whom a number of our members have contracts. Happily this business is negligible—the number of men recommended for hearing-aids last year was officially given as 60.

In view of the 100% purchase tax on leather containers for these instruments, the increased cost of labour, and the limited demand, together with the need for a fair margin for the distributor, as well as an allowance for hospital discounts, it is doubtful whether an efficient instrument can be made available at a low price.

O. C. Leadbitter,
President, Hearing Aid Manufacturers Association.

105, Gower Street,
London, WC1.

HISTOLOGICAL MATERIAL WANTED

Sir,—Some time ago the London (Royal Free Hospital) School of Medicine for Women suffered severe damage from a rocket. Amongst other very serious losses, almost the entire stock of histological material, both blocks and pots of specimens, has been destroyed. We should be most grateful for any human material suitable for the 2nd MB, BS histology course. The material, as fresh as possible, should be put into 7% formol-saline. We will gladly refund any expenses incurred and also return receptacles: we can collect material in London on receipt of a postcard sent to me at the school, 8, Hunter Street, WC1.

Evelyn E. Hewer.

On Active Service

CASUALTIES

DIED

Squadron-Leader George Forbes Rees-Jones, MRCS, RAFVR

Captain John Henry Richardson Barker, MB MANC., RAMC

MISSING PRESUMED KILLED

Surgeon-Lieutenant Alexander Grahame Moray Wilson, MB BIRM., RNVR

AWARDS

OBE

- Lieut.-Colonel F. V. Allen, MB LEEDS, RAMC
- Colonel J. C. Barnetson, MB EDIN., RAMC
- Lieut.-Colonel H. A. Brittain, MB DUBL., FRCS, RAMC
- Lieut.-Colonel D. M. Lyon, MB EDIN., RAMC
- Lieut.-Colonel H. O. M. Merewether, MB EDIN., RAMC
- Lieut.-Colonel L. H. Murray, MD DURH., RAMC
- Colonel P. F. Palmer, MB DUBL., RAMC
- Lieut.-Colonel R. V. Phillipson, LRCPI, RAMC
- Lieut.-Colonel J. C. Reed, MB MELB., RAMC
- Lieut.-Colonel N. G. G. Talbot, MB LOND., RAMC
- Lieut.-Colonel W. H. Valentine, MD CAMB., RAMC
- Colonel G. A. Walmsley, MB DUBL., RAMC
- Lieut.-Colonel G. E. W. Wolstenholme, MRCS, RAMC
- Colonel W. E. Hume, ED, RCAMC
- Lieut.-Colonel G. L. M. Smith, RCAMC
- Lieut.-Colonel E. E. Tieman, RCAMC

MBE

- Major R. J. V. Battle, M CHIR CAMB., FRCS, RAMC
- Major Robert Cox, MB LOND., FRCS, RAMC
- Major S. W. J. Harbutt, MB NZ, FRCS, RAMC
- Major W. A. Heggie, MC, MB GLASG., RAMC
- Lieutenant H. B. Sen, IAMC
- Captain D. H. Jones, MRCS, RAMC
- Major R. A. King, MB LOND., FRCS, RAMC
- Captain Duncan Macdonald, MB GLASG., RAMC
- Major H. B. Porteous, MD EDIN., RAMC
- Captain J. N. U. Russell, MB DUBL., RAMC
- Major R. D. Rutherford, MRCS, RAMC
- Major Barbara Stimson, MD COLUMBIA, RAMC
- Captain M. G. Sutton, MB LOND., RAMC
- Major L. G. Alexander, MC, RCAMC
- Major G. C. McGarry, RCAMC
- Major W. T. Mustard, RCAMC
- Major A. E. Thoms, RCAMC
- Captain M. M. Campbell, MB GLASG., RAMC
- Major J. J. Elbert, MB GLASG., RAMC

MC

- Captain J. J. Y. Dawson, MB LOND., RAMC
- Captain J. M. Hamilton, MB GLASG., RAMC
- Captain J. T. A. Essex, MB BIRM., RAMC
- Captain J. K. Mackay, MB ABERD., RAMC
- Captain D. C. Watson, MB LPOOL, RAMC
- Captain J. H. Fraser, RCAMC
- Captain J. S. I'A. Chesshire, MB BIRM., RAMC
- Captain R. A. B. Kinloch, MRCS, RAMC
- Captain T. C. Thorne, MRCS, RAMC
- Captain G. V. Faulkner, MD MCGILL, IMS
- Captain J. P. J. Burns, MB BELF., RAMC
- Captain W. F. Caldwell, MB GLASG., RAMC
- Captain J. B. Jayne, MRCS, RAMC
- Captain J. W. L. Kemp, MB LOND., RAMC
- Captain L. M. Reid, MB CAMB., RAMC
- Captain C. L. Kashyap, MB, IAMC

GM

Captain C. A. G. Cook, MRCS, RAMC

CROIX DE GUERRE

Captain J. L. Wormald, MB DURH., RAMC

MEMOIR

Squadron-Leader G. F. Rees-Jones was born in 1908, and studied medicine at Glasgow University and University College Hospital, London. After qualifying in 1931 he entered general practice and in 1938 was given a commission as flying-officer in the medical branch of the RAFVR. Before being called up on the outbreak of war he obtained the DMRE, and when he died he was serving as radiologist at a Royal Air Force general hospital overseas.

At the request of the Netherlands government, Prof John Beattie of the Royal College of Surgeons is now serving on the advisory committee of Shaef Netherlands mission which is advising that government on the measures necessary for the relief of famine conditions in northern Holland. Professor Beattie has charge of the laboratory and chemical investigations, and has been selected because he has developed and tested in the college laboratories the use of amino-acids in treatment. He has with him in Holland members of the technical staff of the college who are training Dutch technicians in the relevant procedures.

Obituary

HUBERT BOND

KBE, M D, D SC EDIN., LL B LOND., F R C P

LESS than three weeks after retiring from the office of senior commissioner of the Board of Control, which he had held since 1930, Sir Hubert Bond died on April 18 at his home at St. Anne's-on-Sea in Lancashire. So ends a long life effectively devoted to the care of the mentally afflicted and the improvement of their treatment.

Press Portrait Bureau

His father, the Rev. Alfred Bond, had two sons, the younger of whom is Sir [illegible] did well at Edinburgh University where he was Mackenzie bursar in 1889 and qualified in 1892, taking his B Sc in public health in the following year. In the university he was assistant demonstrator of anatomy, physiology, and botany, and was medallist in anatomy and medical jurisprudence: but his thoughts soon inclined chiefly to psychological medicine, in which he won the Gaskell prize and gold medal in 1897. After holding junior posts at Morningside, and at Wakefield and Banstead, he became deputy superintendent of the LCC mental hospital at Bexley in 1898. His first independent command was the Ewell Colony for Epileptics (1903–07), whence he went to the LCC mental hospital at Long Grove (1907–12). He proved himself a first-class administrator—considerate, courteous, progressive, and efficient. He somehow brought out the best in those with whom he worked: he could change an atmosphere.

The second part of his career began in 1912 with his [illegible] in lunacy, and he joined [illegible]missioner in 1914. From [illegible] Maudsley Hospital, and both there and elsewhere he continued to exercise an influence which was steadily valuable. He was a persistent and successful advocate of voluntary treatment: in his presidential address to the Royal Medico-Psycho[illegible] out that the public's [illegible]arly treatment, for [illegible]efore any form of [illegible]secured. In another [illegible] there was adequate provision for mentally disordered patients who were antagonistic to treatment, these were really the smallest group; and it would be disastrous if the mental hospital became entirely or even mainly concerned with the reception of the unwilling.

By an irony of fate this advocate of voluntary care won public fame as defendant in an action for wrongful detention as a lunatic. At the first trial of Harnett *v.* Bond and Adam (*Lancet*, 1924, i, 514) the jury assessed the damages at no less than £25,000, judgment being given for £5000 against Dr. Bond personally, and £20,000 jointly against him and Dr. Adam. This finding, which was scarcely encouraging to medical men attempting to perform a public duty, was set aside by the Court of Appeal (*Ibid*, pp 1063, 1072) which ordered a new trial and gave Dr. Bond the costs of his appeal; the plaintiff eventually contented himself by accepting £250 paid into court and no new trial was held. The case demonstrated the unsatisfactory state of the law in various respects; but after the Royal Commission on Lunacy had reported in 1926, the country had to wait until 1930 for the Mental Treatment Act. This realised one at least of Bond's aims by providing for admission of voluntary patients to public mental hospitals, and for the temporary treatment of persons not objecting to it.

Bond was early known to his psychiatric colleagues as hon. secretary of the Royal Medico-Psychological Association from 1906 to 1912. During the last war his services were lent to the Army Council to organise mental hospitals as war hospitals, and he was appointed CBE in 1920 in recognition of his work. After the war he was a member of the War Office shell-shock committee; in 1922–23 he presided over the section of psychiatry of the Royal Society of Medicine, and from 1922 to 1924 he was chairman of a departmental committee on nursing in county and county-borough mental hospitals. In 1925 he was appointed consultant in neurology and mental disorders to the Royal Navy, and he was knighted in 1929. His writings were chiefly official but his interests were by no means confined to the arduous duties of his appointments. From 1937, when he was elected a vice-president, he gave generously of his time and thought to the Lebanon Hospital for Mental Diseases, established near Beirut, [illegible] he court of assistants of the [illegible] Clergymen. He married in [illegible]rie and leaves a daughter.

Sir Laurence Brock, late chairman of the Board of Control, writes: "May I as a colleague of Sir Hubert Bond for 17 years add a personal tribute to the formal account of his long and distinguished career? After a brilliant career at the Edinburgh medical school, which then had a staff of unusual excellence, it was not surprising that when he decided [illegible] cine he went to Morningsi[illegible] of whom he always spoke [illegible] almost to reverence. It was not, however, till he came south and joined the London County Council service that his remarkable gifts first attracted attention. After holding various junior posts he became deputy at the newly opened Bexley Heath mental hospital, and from there at an unusually early age he went to be the first medical superintendent of what was then called Ewell Colony. His success here led to his being chosen to open the important Long Grove mental hospital, where he remained long enough to become recognised as the best superintendent in the London service. His appointment in 1912 as a commissioner in lunacy was a natural sequel [illegible] he Board of Control until [illegible] when he was already well [illegible]e was a commissioner for [illegible] imagine the Board without him.

"In person he was small and [illegible] was amazingly tough and until [illegible] had an illness except for the tim[illegible] Grove fractured his skull with a gas-pipe—an injury which only a man of exceptional physique would have survived. The short beard which he had worn for many years gave him a curiously foreign air. Indeed he has been described as looking like the conventional stage Frenchman, and his unusual appearance led more than once to disconcerting mistakes, mistakes which he himself secretly enjoyed. In middle life he was trim and careful in his dress, but in his later years he became a little indifferent to clothes except on ceremonial occasions. He was not naturally a fluent or easy speaker, but his wisdom combined with vast experience always secured him an attentive hearing at the gatherings of psychiatrists [illegible]wed to [illegible] the Ro[illegible] was for many years the secretary and in 1921 the president. He was in fac[illegible]sychiatry. His presidential a[illegible] forgotten, outlined many [illegible]e won general acceptance. But he was too busy a man to write much and his influence on his generation was personal rather than literary. It would not be true to say that his knowledge and experience died with him, but his gift lay rather in inspiring and encouraging others than in formal writing. Not a few men who have since won distinction in psychiatry owe some at least of their ideas to Bond's influence.

"Perhaps his most salient characteristics were his extraordinary kindness and his intense and unwavering [illegible]ttered in comparison with the [illegible] His kindness to individual [illegible] was without limit. Always a busy man, he was never too busy to write to any patient who asked for his help. Indeed, I had sometimes to reproach him for spending time which he could ill afford on correspondence with patients which he might have left to others. In visiting mental hospitals he had no equal. Patients and staff alike appreciated his visits. He was singularly free from any inspectorial or fault-finding habit of mind; his one desire was to help and encourage, though no-one could be sterner. if occasion demanded it, in condemning any indifference to the patients' welfare or any departure from the high standard of medical ethics which he observed himself and expected from others.

"Bond was an intensely sociable man. He enjoyed good talk, good company, and good cheer; he was an admirable host and the most hospitable of men. Perhaps he enjoyed himself most at the European reunions of psychiatrists, at which he was a familiar and popular figure, in spite of the fact that he was no linguist. Barriers of language did not seem to trouble him, and he would have got on good terms with a Chinese or an Eskimo. Everyone at these continental gatherings seemed to know and to like 'Monsieur Sir Bond,' as I have heard him called.

"In his relations with others, especially with his colleagues, he was the soul of kindness. He never minded if we laughed, as I confess we sometimes did, at the mixed metaphors into which his exuberance of speech occasionally led him. He spoke evil of no-one; indeed I can recall only one occasion when he spoke with any bitterness of one at whose hands he had suffered much. His abounding charity sometimes amounted to credulousness and resulted in his supporting some who did not deserve the help he gave them.

"There can be no doubt that he shortened his life by his refusal to retire after a grave illness at the beginning of 1944, but he took the view that there was still work that he could do and ought to do. He had few hobbies except fell-walking and visiting old churches; he lived for his work. His passing has robbed many colleagues, doctors, and patients, of an old and valued friend; but he has been spared the inactivity which he dreaded: 'Nothing is here for tears.' His work was done, and now he has gone, leaving with us a memory which will not easily fade."

A memorial service to Sir Hubert Bond is being held in the chapel at Long Grove Hospital, Epsom, Surrey, today, Saturday, May 5, at 12 noon.

GUY BELLINGHAM SMITH

M B LOND., F R C S

Mr. Bellingham Smith, consulting obstetric surgeon to Guy's Hospital, was within a few days of his eightieth birthday when he died at Felstead on April 19. He was the eldest of a large family, the youngest of whom is Dr. Eric Bellingham Smith of St. George's Hospital. After a brilliant career at St. Paul's School he came to Guy's in 1883 and quickly made his mark. He shared the honours at every stage of his student career with Ernest Starling, destined to become one of the hospital's distinguished alumni. In those days there was not much between the two men in academic attainment, but "G. B." was the more practical and early showed a natural bent for surgery. He qualified in 1888 and got his FRCS in 1890, but it was twelve years before he reached the department of the hospital in which he was to spend the rest of his professional life, having in the meantime been surgical registrar and ophthalmic assistant at Guy's and resident surgeon at the South-Western Fever Hospital. The experience in different branches of medicine gained during these preliminary years undoubtedly helped to make Bellingham Smith the remarkable clinician he was. In 1903 he was appointed obstetric assistant at Guy's and soon showed that he had found his true vocation. He rapidly acquired skill and experience in midwifery under the rough conditions of a maternity district in which 2500 babies were born every year, and he was soon in demand as an obstetrician. But he was never fond of midwifery and in later years could only be persuaded to attend the wives of his friends. As a gynæcologist he was expert in diagnosis and in operating, and his knowledge of the pathology of his specialty was widely recognised. At the height of his powers he was regarded as his hospital's best operator, for he combined manual dexterity with a clinical judgment which was the more impressive because his quick decisions did not appear to be reached by any process of deductive reasoning. As a result his operations were performed with remarkable celerity, and his patients made rapid recoveries. He carried his abhorrence of showy surgery almost too far, for a story was told of him arriving for an important operation in the country with four pairs of Spencer Wells, a pair of scissors, and a scalpel stuck in a cork as his sole equipment—all loose in his pocket. Like most hospital gynæcologists his patients included the wives and daughters of many medical colleagues and innumerable nurses sought his advice; to all these he was easily accessible. Fees interested him little and he was often imposed on, but he earned the gratitude of a multitude of deserving patients of small means. Although he made no great contributions to medical literature he had the distinction of being the first to draw attention to the association of pyelitis with pregnancy (*J. Obstet. Gynæc.* 1905, 8, 73) and his section in Jacobson's *Operations of Surgery* (second edition) presented the operative procedures of his specialty with masterly clarity.

Apart from his profession, Bellingham Smith's chief interests were in art in all its branches. There was a strong strain of artistic talent in his family. One brother was a notable painter and his daughter Eleanor carries on the family tradion. G. B. had a remarkable flair for connoisseurship. He was a discriminating collector of prints, drawings, and paintings, and his advice was often sought by the British Museum print experts and by dealers. At different times he amassed representative collections of old English glass, Japanese sword hilts, and Chinese porcelain. In one short burst of activity he astonished philatelists by producing a unique collection of the postage stamps of the State of Kashmir. His only interest in this sphere was the difficult problem of detecting spurious examples, and he was annoyed to see himself styled in the technical journals of philately as "the well-known stamp collector." This was an instance of his remarkable capacity for absorbing all that there was to be known about the technique of a craft in the shortest possible time.

Bellingham Smith was a kindly man who loved children. In his later years he had an almost daily meeting with a small grandson in Regent's Park. His wide circle of friends included many doctors, artists, art dealers, and ex-patients. It gave him particular pleasure to be elected president of "Our Club," one of the oldest of the many Guy's dining clubs, after the death of Sir Charters Symonds. He leaves a widow and two daughters.

H. L. E. writes: "I first met Bellingham Smith in 1895, when he was surgical registrar and I was a humble surgical ward-clerk. He was then, as always, an excellent teacher, stimulating, and beloved by the students as he was free of the habit common to many teachers of being humorous and sarcastic at the expense of the defenceless pupil. At that time he was a good-looking young man with black wavy hair and a large military moustache. A subsequent attack of alopecia removed half the moustache and a considerable quantity of hair and for the rest of his life he was the rather bald and clean-shaven G. B. S. familiar to generations of Guy's men. After a year or two he changed over to the Eye Department as a clinical assistant, but did not remain there more than a year or two. He gave up ophthalmology for two reasons. He was an excellent morbid histologist and could see, as he said, little pathological interest in a piece of tissue less than an eighth of an inch thick. But the more cogent reason was that he had an obsessional horror of having to do a tenotomy of the ocular muscles. If such an operation had to be done he could hardly sleep the night before. It was one of those terrors of a particular operation which have afflicted many a sensitive surgeon. He therefore took the opportunity of being appointed to the gynæcological department, where he rapidly became a most skilful operator, entirely revolutionising the surgical technique of that department, taking minutes for difficult abdominal operations where his predecessors had taken any time up to three hours. He could not have had an enemy. His kindness and charity towards his fellow men was such that all who met him or worked with him were devotees. His interest in his hospital was deep and lasting and for fifty years G. B. S. was a 'character' at Guy's."

Notes and News

BIRTH AND SURVIVAL

LAST year, for England and Wales, a provisional birth rate of 18 0—the highest since 1925—was recorded[1] Live births reached 745,318, the highest total since 1923, exceeding the 1943 rate by 1 5 The effective reproduction rate for 1944 has been provisionally assessed at 99%—within 1% of full replacement standard a figure not reached since 1922 The lowest figure was in 1941 when the rate fell to 76%

In the last quarter of 1944 the infant mortality rate was the lowest ever recorded—46 per 1000 related live births—and the stillbirth figure of 28 per 1000 total births also made a new low record The death rate of 11 9 per 1000 population was 0 2 below that of 1943 but 0 3 above that of 1942 The marriage rate in 1943 was the lowest since 1926, last year it rose to 14 6 per 1000 population which represents 6632 more marriages than in the previous year Live births exceeded total deaths by 253 040, with an increase of 71 239 over the previous year's figure

The live birth rate during the December quarter of 1944 was 17 1 per 1000, as compared with 15 4 in the corresponding quarter of 1943 There were 1057 boys born for every 1000 girls The stillbirth rate was the same as for the year as a whole (28 per 1000 total births) and the infant mortality rate a little lower (44 per 1000 related births) The death rate was 11 8, as compared with 14 6 in the corresponding quarter of 1943

BIRTH RATES IN TWO WARS

Year	*1914*	*1915*	*1916*	*1917*	*1918*	*1919*
Rate	23 8	21 8	21 0	17 8	17 7	18 5
Year	*1939*	*1940*	*1941*	*1942*	*1943*	*1944*
Rate	14 9	14 6	14 2	15 8	16 5	18 0

The trend of the birth rate in the two European wars is shown in the table After the 1914 18 war the rate rose from 18 5 in 1919 to 25 5 in 1920 when it began to fall to the low rate of 1939

WITH THE RED CROSS IN CHINA

INFORMATION on Red Cross work in China during these war years has been far too scanty and it was a happy thought to issue as a pamphlet[2] a collection of the racy letters of Dr Robert McClure a young Canadian medical missionary who, since 1938 has been working for the International Red Cross and with the Friends Ambulance Unit He is now field director of the Red Cross in China with supervision of the staff and equipment of fourteen of their hospitals Born in China, and possessing a deep and sympathetic understanding of the Chinese people he draws a vivid picture of the difficulties under which the work has had to be carried out, the cheerful endurance and splendid morale of the people We get glimpses of extraordinary journeys through Burma along the Burma Road, through Indo China and the remote provinces in the South West, of ambulances fitted to burn coal or charcoal, in default of petrol, of mobile surgical teams and X ray units following the troops into Burma of the constant fight against sepsis and disease and neglect, and of the immense need for surgical dressings drugs and instruments from this country Wounded Chinese soldiers have been warm in their appreciation of what has been done for them, and perhaps the choicest story of all is that of the soldier who stopped Dr McClure in the streets of Kunming and nearly embraced him exclaiming, with a beaming smile, that "One of you foreign devils picked me up off a battlefield in Burma!"

A FRESH ASSAULT ON LEPROSY

No disease—not even cancer—has such an age long association with misery and despair as leprosy This year Belra—the British Empire Leprosy Relief Association—reaches its twenty first anniversary, and to mark the occasion has opened a £210 000 fund in aid of a campaign to rid our colonies of the disease The fund was launched at the Mansion House on April 26 the King being the first contributor There are estimated to be about 2,000 000 lepers in the Empire, and spread of the disease is associated, as Sir Alfred Beit reminded the meeting with bad living conditions He suggested that we can do much to prevent it by improving standards of living in the affected regions Sir Bernard Bourdillon former Governor of Nigeria, pointed out that the fund will be able to sponsor research into better methods of treatment

In an account of the Island of Chacachacare, the leper colony of Trinidad and British Guiana, Dr Ernest Muir, medical secretary of Belra, drew a remarkable contrast between the effects to be expected of compulsory treatment and treatment sought voluntarily According to the Leprosy Ordinance of Trinidad, all infectious lepers are interned on the island—a lovely spot, but to them a prison Dr Muir had come to Chacachacare from work in India and Africa, where lepers crowd the hospitals, seeking treatment only fearful lest by some misconduct they should forfeit their opportunity to some more coöperative patient But the interned patients of Trinidad, he found, have the resentment of those whose fate has been taken out of [illegible] they [illegible] t cure [illegible] as Dr [illegible] have a chance of recovery, he must have a contented, cheerful, and active mind and be engaged in carefully regulated physical occupation " He spoke of the slow response to his teaching that they were giving up their liberty to save the next generation from infection, and of the great change in mood and spirit which followed the successful trial of new methods of treatment

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Royal College of Physicians of London

At a meeting of the college held on April 26 with Lord MORAN, the President [illegible] lected to the fellowship [illegible] Major General S R [illegible] Rock CARLING, London [illegible] US, C H WHITTLE, [illegible] outh, J A BIRRELL, [illegible] orge FLETCHER Manchester, C S HALLPIKE London, MAURICE MITMAN, Dartford, ARTHUR BURROWS London, R G COCHRANE, Madras, Brigadier G W BAMBER, London Lieut Colonel EWEN DOWNIE, Melbourne, A MARGARET C MACPHERSON, London A G OGILVIE, Newcastle on Tyne, PHILIP ELLMAN, London, C A BIRCH, London, BENJAMIN BARLING, London, ELIOT SLATER, Oxford, Lieut Colonel T F GUMPERT, Sheffield Lieut Colonel W C SMALLWOOD, Birmingham, H C TROWELL, Uganda, C H ROGERSON, Stoke on Trent, Lieut Colonel STANLEY ALSTEAD Glasgow, Lieut Colonel P R EVANS London, L J DAVIS, Edinburgh, MAHMOUD FEKAN, Cairo, W H KAUNTZE, London, Lieut Colonel W R M DREW, London, S A HENRY, London

Dr L [illegible] were appointed representat[illegible] onal Association of Matern[illegible] ord Moran was elected representative on the governing body of the British Postgraduate Medical School and Sir Arthur Hall on the board of governors of Sheffield University Dr G I S Ward was appointed an external examiner in medicine for the fellowship examination of the Faculty of Radiologists

The following having satisfied the censors' board, were admitted to the membership:

T J Agius [illegible] IND M [illegible] G L B News [illegible] Pond [illegible] MB CAMB, J M [illegible]

Licences to practise were conferred upon the following 139 candidates (110 men and 29 women) who have passed the final examination of the Conjoint Board

E M Allen C F Allfrey [illegible] A J Alment, W M Anderson I T Anderton, R J Aspinal D J Atherton C M Attwood D A Bailey, R W Barr Brown H I M Bassett A J T Bate [illegible]

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[1] Registrar General's Summary of Vital Statistics for 1944

[2] The Red Cross at Work in China Published by the United Aid to China Fund, 57 New Bond Street, London, W1 1s

Metcalfe, J. N. Micklem, Mary H. Moller, R. E. Moore, J. A. B. Mounsey, Margaret C. Myddelton, R. F. Naunton, Moragh J. Noakes, Clifford Ormston, Jannette D. A. Owen, T. E. Owen, Frances I. Panton, Cynthia M. Parrott, R. F. Payne, Noel J. Pease, Thelma M. Phelps, B. L. C. Phillips, J. R. H. Pinkerton, J. L. Pring, C. W. A. Pullan, D. A. Pyke, R. J. Rabett, Roy Randell, Derek Richter, E. G. G. Roberts, R. L. B. Roberts, D. J. Rudman, P. I. Rutherford, A. H. B. Rydon, Betty J. Schofield, J. C. Seymour, D. S. Sharpe, Joan M. Sheehan, G. W. Shepherd, N. I. A. Shohet, Betty E. Shortland, P. H. S. Silver, R. B. Sloane, John Stevenson, H. J. C. Swan, Margaret M. Sweeney, M. T. Sweetnam, J. C. Talbot, B. Q. T. Taylor, W. D. G. Tellam, J. M. Thomas, Mary E. Upsdell, D. F. van Zwanenberg, C. C. Vidot, O. L. Wade, R. V. Walley, E. M. Watts, William Waugh, N. T. Welford, P. W. Wells, J. D. Whitehouse, Michael Wigram, D. J. K. Wilkie, G. V. S. Wright, and F. J. Yeardsley.

Diplomas in ophthalmic medicine and surgery and in medical radiology were granted to the candidates named in the report of the meeting of the Royal College of Surgeons in our issue of March 24 (p. 389) and diplomas in child health to those named in our issue of April 21 (p. 518). A diploma in medical radiotherapy was also granted to L. M. Shorvon, and in medical radiodiagnosis to J. A. Ireland.

University of Cambridge

On April 27 the degrees of MB, B Chir, were conferred by proxy on P. B. S. Cooper, J. J. Fleminger, R. J. Harrison, and M. B. McIlroy.

Chadwick Lecture

On Tuesday, May 8, at 2 20 PM, at 26, Portland Place, London, W1, Mr. Eardley Holland will deliver a Chadwick lecture on the importance of a maternity service in the life of the nation.

Royal Society of Medicine

The section of psychiatry will meet on Tuesday, May 8, at 5 PM, when Mr. G. D. Greville, D SC, and Dr. Derek Richter will open a discussion on biochemistry and psychiatry. Mr. J. H. Quastel, FRS, will also speak.

Lecture for Expectant Mothers

The National Birthday Trust Fund has prepared an illustrated lecture *The Expectant Mother* for use in teaching mothers at antenatal clinics at hospitals. The new 'Synchrophone' process has been used.

Freeman of Croydon

On April 28 Major-General Sir Ernest Cowell was presented with the freedom of Croydon. Sir Ernest has lived in the borough for many years and is surgeon to Croydon General Hospital.

Royal Medico-Psychological Association

At a meeting of the child psychiatry subcommittee to be held at the City Council House, Victoria Square, Birmingham, on Wednesday, May 30, at 11 AM, Dr. Edward Stern will open a discussion on psychoses in children. The quarterly meeting of the association will begin the following day at 10.15 AM when Dr. Alfred Meyer will read a paper on neuropathological problems arising from leucotomy, and Dr. F. A. Pickworth on the physiology and pathogenesis of amnesia. At 2.15 PM Lieut.-Colonel A. A. W. Petrie, the president, will deliver his valedictory address on the reduction of the distinctions drawn between mental ill health and physical ill health.

Value of Early Diagnosis to Industry

A course on this topic will be held on Saturday and Sunday, May 12 and 13, at the London School of Hygiene, Keppel Street, WC1. On Saturday, at 2 PM, Dr. A. J. Amor, chief medical officer to the Ministry of Supply, will speak on the clinical approach to industrial medicine, and at 3.30 PM, Mr. R. F. Milton, FRIC, head chemist to the department for research in industrial medicine, London Hospital, on the early investigation of the industrial environment.

On Sunday, at 10.30 AM, Dr. Donald Hunter, director of the department, will discuss the early diagnosis of industrial diseases; at 11.45 AM, Prof. Ida Mann, director of the Nuffield Laboratory of Ophthalmology at Oxford, the early diagnosis of diseases and injuries of the eye; and at 2.15 PM, Lieut.-Colonel G. R. Hargreaves, assistant director of Army Psychiatry, personnel selection and its relationship to mental health. The fee of one guinea for the course should be sent to the secretary of the School not later than Monday, May 7.

The fact that goods made of raw materials in short supply owing to war cond[illegible] *as an indic*[illegible]

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED APRIL 21

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1356; [illegible]: diphtheria, 565; paratyphoid [illegible] (excluding rubella), 15,901; pneumonia (primary or influenzal), 573; puerperal pyrexia, 167; cerebrospinal fever, 73; poliomyelitis, 8; polio-encephalitis, 1; encephalitis lethargica, 3; dysentery, 523; ophtha[illegible] 68. No case of cholera, plague, or [illegible] notified during the week.

T[illegible] Infectious Hospitals of [illegible] 1178. During the pr[illegible]: scarlet fever, 33; di[illegible]; whooping-cough, 14.

Deaths.—In 126 great towns there were no deaths from enteric fever, 3 (0) from scarlet fever, 13 (2) from measles, 9 (0) from whooping-cough, 7 (1) from diphtheria, 47 (1) from diarrhœa and enteritis under two years, and 11 (1) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 199 (corresponding to a rate of 30 per thousand total births), including 14 in London.

Appointments

BROWN, A. R., MB GLASG.: temp. hon. physiotherapeutist, depart[illegible]

LAID[illegible]

MAC[illegible] Newcastle-on-Tyne.

STEEN, PHILIP, MD BELF.: RSO, Brompton Hospital, London.

SUTHERLAND, V. L., MB ABERD.: asst. MO, Kingston Public Hospital, Jamaica.

THOMAS, J. G. TREHARNE, MC, MA CAMB., MRCS, DPM: medical superintendent, Cambridgeshire Mental Hospital, Fulbourn.

TWEEDIE, M. C. K., M SC, A INST P: physicist at the radiotherapeutic centre, Addenbrooke's Hospital, Cambridge.

Births, Marriages, and Deaths

BIRTHS

BARTON.—On April 26, the wife of Dr. J. D. M. Barton, of Weybridge—a daughter.

GARIBIAN.—On April 22, the wife of Dr. Stephen Garibian—twin sons.

HARRIS.—On April 16, at Chailey, the wife of Dr. E. E. Harris—a son.

HOWARD-JONES.—On April 22, in London, the wife of Dr. N. Howard-Jones—a son.

JAMES.—On April 21, in London, the wife of Captain Ronald James, RAMC—a daughter.

JAPHA.—On April 21, in London, the wife of Dr. E. M. Japha—a daughter.

KIDD.—On April 17, at Hexham, Northumberland, the wife of Surgeon Lieutenant John Kidd, RNVR—a daughter.

MANDEL.—On April 27, in London, the wife of Dr. Sydney Mandel—a son.

OLLERENSHAW.—On April 22, at Esher, the wife of Dr. Gerald Ollerenshaw—a son.

PALLOT.—On April 19, at Woking, the wife of Surgeon Lieutenant J. M. Pallot, RNVR—a son.

STEED.—On April 23, at Broadstairs, the wife of Squadron-Leader G. R. Steed, MRCP—twin sons.

WELFORD.—On April 21, at Saxmundham, Suffolk, the wife of Dr. C. R. B. Welford—a daughter.

WILLIAMS.—On April 21, at Cardiff, the wife of Captain H. B. Lloyd Williams, RAMC—a daughter.

MARRIAGES

CROMAR—WATT.—On April 14, at Jhansi, India, W. N. Cromar, captain, the Scinde Horse, to Doreen Margaret Watt, MB.

MILES—KELLY.—On April 21, at Naples, Basil Elystan Miles, captain, RAMC, to Sarah Kelly, QAIMNSR.

NORMAN—DUNLOP.—On April 21, at Edinburgh, J. Edward Norman, MB, to Mary Ann Ross Dunlop.

SEARLE—ALBAN.—On April 23, at Llanidloes, Montgomeryshire, Charles Searle, lieut.-colonel IMS, to Ruth Alban.

DEATHS

LITTLE.—On April 24, Frank Ernest Little, MRCS, aged 85.

PHILIP.—On April 26, at Epsom, Thomas Williams Philip, MB ABERD., surgeon captain RN retd.

PINHEY.—On April 23, Eustace Townley Pinhey, OBE, MB, CH M, medical superintendent, St. Pancras Hospital, and formerly of St. Clement's Hospital.

WILLIAMS.—On April 26, at Stoke Newington, Philip George Williams, FRCSE, aged 71.

REVIVAL OF EARLY WOUND CLOSURE

TWO-STAGE OPERATION AS APPLIED IN ITALY

HAROLD C. EDWARDS, M S LOND., F R C S
BRIGADIER
CONSULTING SURGEON, CENTRAL MEDITERRANEAN FORCES

THE surgery of war wounds has gone full circle. In the official history of the 1914–18 war[1] we are informed that, after previous unsuccessful ventures, early wound suture after debridement was reinvestigated in 1917. A report by Captain Forbes Fraser, circulated in March, 1918, considered both primary and delayed primary closure.

In Italy in the closing phases of World War II treatment of the debrided wound by delayed closure has been practised as a routine, primary suture being reserved for wounds of the face and scalp. The term "two-stage operation" has been used to describe the process, and though it is open to objection as having a flavour of propaganda it has been all the more useful in the field because it is something of a slogan. It is moreover justified by the following facts.

When a missile enters the body not only does it provide transport for pathogenic organisms picked up as it passes through skin and clothing, but by damaging the tissues it creates an ideal home for these organisms. The object of early surgery is to wreck this home and make it inhospitable. The forward surgeon does this by removal of clot and foreign bodies, by excision of grossly contaminated and devitalised tissue, and by providing for unimpeded drainage through free incision of skin and fascia. He will further increase the inhospitability of the wound by using a bacteriostatic. The success of this initial operation will be apparent in 2–4 days; if there are then no signs of acute inflammation in the wound or around the wound, its object has been achieved.

Having obtained the desired result—a wound which has resisted attack by the original infection by organisms—the next obligations are to get the wound healed in minimum time and to prevent reinfection. These obligations are of course closely related. Both may be fulfilled by closing the wound, which may safely be done where there are no signs of inflammation. Nothing indeed can now be gained by leaving the wound open, and much may be lost. The presence of a fracture is no contra-indication: on the contrary, it makes early closure even more desirable.

Thus the whole operative procedure may be conceived as one operation performed in two stages—a preliminary debridement to guard against sepsis, with a waiting period to determine success, followed by suture preferably between the 3rd and 5th day.

The importance of early closure was in the minds of many surgeons when the present war began, and an [illegible] the first expedition [illegible] the enforced with- [illegible] Vestern Desert the difficulties arising from lengthy and ever-changing lines [illegible] too great for its adoption. [illegible] of the front coincided with [illegible] work on wound closure of Lieut.-Colonel Ian Fraser and others in Tunisia and Lieut.-Colonel J. S. Jeffrey and others in Tripolitania—still recent history—was continued through Sicily into Italy. In the first quarter of 1914, Lieut.-Colonel Jeffrey, and Lieut.-Colonels F. H. Bentley, J. J. Mason Brown, and R. W. Hendry, and others, had brought the technique of early closure to a point at which it seemed right to accept it as the standard method of treatment. For the revival of delayed suture more credit probably belongs to penicillin than to any other single factor, not only because of its bacteriostatic action, but also because of the stimulus it provided to experiment.

From the pooled experience of senior surgeons who had served with both 8th and 1st Army, a set of "rules" was drawn up:

(a) Debridement of wounds at forward units must be thorough.
(b) The dressing on a wound must not be disturbed during evacuation from forward units to base hospitals, unless the indications for doing so are absolute.

As one surgeon put it, inspection means infection. This is the rule which has been hardest to enforce; changing a soiled for a clean dressing is a natural impulse, difficult to resist. That insistence upon this rule is justified has recently been shown by Lieut.-Colonel Bentley and Major Scott Thomson, who found that 48% of 163 wounds dressed during evacuation were infected with pathogens, as against 33% of 610 undisturbed wounds.

(c) The first dressing must be done under aseptic conditions in the operating-theatre, the optimum time being 3–5 days after the initial operation.
(d) The wound must be closed at once if it looks suitable, bacteriological examination being ignored as a criterion for closure.
(e) The patient must be retained in hospital until the sutures are removed.

This last rule is of considerable importance. In a small series of cases of delayed suture evacuated from hospitals in eastern Italy to hospitals in western Italy after the battle of the Gothic Line, there was a high proportion of failures.

A MASS EXPERIMENT

The opportunity to carry out delayed primary suture on a large scale came at Cassino, the D-day for which was May 11. No better opportunity could have presented itself, for the medical arrangements in this battle were probably as favourable to the outcome of surgery as those of any campaign in history. Forward base hospitals were only a few hours away from the front line, and beds were adequate in number.

During the 17 days May 15–31, flesh wounds in 1032 patients were repaired between the 3rd and 6th day of wounding in eighteen different general hospitals. Of 640 cases, irrespective of what bacteriostatic was used, 539 (84%) were healed by first intention within 12 days. Of 951 cases, 877 (91%) were adjudged to have been at least 90% successful. Of 234 wounds in which penicillin was used in both stages of the operation, 200 (89%) healed by first intention.

A census taken on August 7 of the 4500 (approx.) British wounded during this period showed that, apart from 631 evacuated to the United Kingdom whose late results were unknown, only 125 wounds remained unhealed at the end of two months. These included 11 [illegible] ies or abdominal sinuses, 66 [illegible] 4 amputations. Many of the [illegible] e trivial—small wounds of soft tissue broken down in part after delayed primary suture, or secondary suture; some were small sinuses leading down to a sequestrum, or to a retained foreign body. Only 51 had constitutional symptoms of chronic sepsis.

With experience, surgeons became bolder and the number of wounds denied suture decreased. To the rules first enumerated some refinements were added. Immobilisation during transit is one of them. A plaster splint is now applied to all limb wounds during evacuation, whether or not a fracture is present. This has the added value of deterring those tempted to disregard the veto on inspection of wounds.

The stimulus to forward surgery afforded by early closure has been considerable. Surgeons at forward units have lost any reluctance they may have had to making adequate skin incision for exposure of the deeper structures, because they know that within a few days their incisions will be closed by their colleagues at the base. And the excellence of the forward surgeons' work has given increasing confidence to the surgeons at the base in their powers of repair.

THE RÔLE OF PENICILLIN

Apart from the great abstract contribution, already [illegible]

"Various antiseptics for sutured wounds were employed, such as the mercuric salts, carbolic acid, solution of hypochlorous acid, flavine, and a paste containing bismuth, iodoform and paraffin, commonly known as 'B.I.P.' Each of these had its advocates, and the lotions were no doubt useful in cleansing the skin around the wound as well as the tissues exposed by operation. The general opinion ultimately was that completeness and thoroughness of the surgical operation

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1. Medical Services: Surgery of the War, vol. 1, p. 243.

were sufficient to ensure healing, and that no antiseptic was essential. At the same time many surgeons considered that slightly sticky surfaces resulting from weak solutions of flavine (1–2000) were an aid to suture, and others continued to use 'B.I.P.' and to believe that they got better results with it than without it."

The results of both primary and delayed suture reported during this period of the last war were better than those obtained by delayed suture after the battle of the Gustav Line, successes being estimated at 85–95%. There is reason to believe, however, that the surgeons were then more selective. Thus at twenty-two British general hospitals, of 5539 wounded arriving in August and September, 1918, 48 hours after wounding, 741 were treated by primary suture and 192 by delayed primary suture. After the battle of the Gothic Line about 90% of flesh wounds and 70% of fractures in British and Indian personnel were treated by delayed primary suture. It is thus misleading to make comparisons. Furthermore, the conditions of battle may have differed greatly.

Belief in the value of penicillin has been confirmed by controlled investigations by no. 1 Penicillin Control Unit (Lieut.-Colonel Bentley and Major Scott Thomson) in Italy, and local penicillin is now used as a routine at both stages of the operation. A powder consisting of calcium penicillin (1 part) with sulphathiazole (2 parts) is recommended for all wounds at the first stage and for the more superficial wounds at the second stage. Sodium penicillin by intubation is recommended for the larger and deeper wounds at the second stage. The use of parenteral penicillin is mainly restricted to massive wounds or to multiple serious wounds, and even for these it is not a routine. We are not yet certain of the part it should play.

During the month following D-day for Cassino (May 11), penicillin was in relatively short supply, and was used less extensively than during the month following D-day for the Gothic Line battle (August 25). Approximately 500 mega units of penicillin was given to battle casualties during the first period and approximately 1000 mega units during the second. The ratio of battle casualties was 2:3 for the two periods. The results of the two-stage operation during the first period (given above) are superior to those of the second (given below). The explanation of this paradox is as follows. The fighting at Cassino took place in perfect May weather and lines of communication were short. At first, also, surgeons were more selective in their use of delayed primary suture. During the second period the weather was bad—September was unusually wet, even for Italy. Hence the roads were always difficult and sometimes impassable, and air evacuation often failed. Moreover, lines of communication were long.

The conclusions to be drawn from these observations—one which is already accepted—is that penicillin, like all other bacteriostatics, is the handmaiden of surgery. It in no sense replaces it. Rather should it stimulate surgeons to be even more meticulous with their technique. Given reasonable conditions and the aid of penicillin they should then approach within measurable distance of 100% success in the two-stage operation.

TECHNIQUE OF THE SECOND STAGE (DELAYED PRIMARY SUTURE)

The technique favoured by different surgeons differs considerably, though the differences are mere variations on a theme. Articles which follow will supply details, and only a brief outline will be given here.

The patient is not taken to the theatre till the day after admission to the base hospital, so that a night's rest is assured. The dressing is then removed with aseptic precautions, and, unless contra-indications make suture impossible or imprudent, 'Pentothal' anæsthesia is induced.

Superficial wounds which have been adequately dealt with at the first stage—and nearly all of them have been—are disturbed as little as possible. Any minor revision, such as removal of a tag of tissue. is done after the blood-clot has been gently removed. The edges of the wound are separated from the underlying structures by blunt dissection and brought into apposition by interrupted sutures. It is important to obtain accurate apposition of the skin edges. In deeper wounds the [illegible] is explored, not only to make sure that no revision is needed but also to prepare the site for the reception of penicillin tubes.

Drainage is rarely employed, except at the angles of the suture line of a major amputation. Buried sutures are avoided as far as possible.

With severe fractures, especially those of the femur, there is a tendency to delay suture to the 6th to 10th day, and in one orthopædic centre a large posterior drain is frequently used. This, however, is one of the many subjects of variation among surgeons.

A certain amount of tension is permitted; but where skin loss is considerable, the edges are brought as close as seems wise, and the operation is completed after 5 days, by which time it is often possible to secure close apposition. Where skin loss is great—primary destruction by the missile, for forward surgeons are very conservative with skin—a simple flap may be used, or epithelial cover may be provided by immediate patch skin-grafts.

After operation the limb is put at rest, and as a rule is not disturbed for 10–12 days, after which stitches are removed in the theatre. With deeper wounds, however, or if there is tension after suture, it is increasingly the custom to make an interim inspection in the operating-theatre after 5 days. No dressings or inspections are permitted in the wards.

Amputations both above and below the knee are particularly suited for the technique of delayed suture. Provided no sutures or packing are used at the first stage, the second stage is very simple. The best time for it appears to be about the 4th day, but the flaps remain mobile enough for easy approximation up to the 7th day. A drain is used, which is removed in the operating-theatre on the 2nd or 3rd day. In every one of a recent series of 14 consecutive cases, 90–100% healing was obtained in 14 days (Lieut.-Colonel J. McDougall).

Wounds involving the hand are also well suited. When amputation of fingers is necessary, forward surgeons preserve all viable skin, "coring" out the bone if need be, so that a good flap is ready and waiting to be used by the surgeon at the base.

In the management of large wounds—especially amputations—stress is laid on the importance of the blood-picture as represented by the erythrocyte count, the hæmoglobin, the hæmatocrit index, and the plasma protein (all hospitals are equipped with facilities for Van Slyke's plasma-protein estimation), and any deficiencies are treated by blood-transfusion before the second stage is attempted.

CONTRA-INDICATIONS TO THE SECOND STAGE

The main local contra-indications are:

(1) Acute inflammation in the wound, or of the tissues around it, whether pus be present or not. A "dirty" wound is not necessarily unsuited, for many such wounds show no signs of inflammation, and pyogenic organisms are not more commonly found in them than in wounds which look clean.

(2) The presence of gas in the tissues.

(3) Excessive loss of skin.

When the wound appears unsuited to immediate closure because of sepsis—a comparatively rare event in British patients but not uncommon in prisoners-of-war—it is treated actively with an antiseptic for a few days, and is then repaired. In many cases progress is controlled by bacteriological examination; but it must be emphasised that suitability for immediate closure (i.e., delayed primary suture) is determined by naked-eye inspection alone.

There are some forms of wound—notably compound fractures of the lower end of the tibia—in which suture is often impossible for mechanical reasons. The proportion of wounds that can be sutured cannot yet be exactly estimated, but some impression may be gained from two series of compound fractures admitted into the general wards of two different hospitals. In the first, of 128 consecutive cases of compound fractures 86 (67%) were completely closed. 33 (25%) were partially closed. and 9 (8%) were unsuturable (Lieut.-Colonel Hendry, Majors W. C. Gledhill and B. H. Price). In the second, 62 compound fractures were closed, representing 70% of all fractures admitted during that period (Lieut.-Colonel Bentley). The proportion of "technically" unsuturable flesh wounds is far less—probably not more than 5–8% of all admissions.

FAILURES AND THEIR TREATMENT

A delayed suture which is less than 50% successful is regarded as a failure. The two common causes of failure are [illegible] —or both [illegible] siderably [illegible] of the surgeons.

If failure is complete, a second attempt may be made after preliminary local treatment, usually with penicillin. In partial failures the unhealed area may be covered with patch-grafts. In other cases again, it may be best to wait a week or more and perform a "secondary suture." This term is used to describe the operation required when the time during which delayed primary suture is still possible (usually less than 10 days) has elapsed. It is indicated at any time from 14 to 16 days onwards. The granulation tissue is removed and the skin edges excised. In effect, the old unhealed wound is replaced by a new one which is immediately closed. Often a flap is needed, and if the wound is large and requires more than the average skill of the general surgeon, the case is transferred to one of the two maxillo-facial centres in the Command.

Occasionally failure is due to the retention of unsuspected metal fragments, and of course sometimes to sequestra. But no wound is allowed to remain unhealed without good cause.

RESULTS

Immediate results.—At least 17,000–18,000 wounds were closed by delayed primary suture or secondary suture between May 12 and the end of 1944 among British and Indian officers and men. I leave the details to the surgeons contributing subsequent articles. It will suffice to record results of cases operated upon during September and October in twenty-one of the British and Indian hospitals in CMF These fairly represent the standard achieved throughout the Command, the operations being performed by senior and junior surgeons and by trainees in surgery; surgeons with wide experience of wound repair will achieve results somewhat better. The data shown in table I are derived from an analysis carried out for me by Captain C. Parish, RAMC, of 3845 proformas designed for the investigation. A rough division in to three standards of healing has been made.

TABLE I—RESULTS OF TWO-STAGE OPERATION

	DELAYED PRIMARY SUTURE				SECONDARY SUTURE			
	Total	Grade I (100–90%)	Grade II (89–50%)	Grade III Failures (under 50%)	Total	Grade I (100–90%)	Grade II (89–50%)	Grade III Failures (under 50%)
All wounds	3435	2693 (78%)	537 (16%)	205 (6%)	410	276 (67%)	96 (24%)	38 (9%)
Compound fractures	429	311 (73%)	79 (18%)	39 (9%)	69	44 (64%)	20 (29%)	5 (7%)
Flesh wounds	3006	2382 (79%)	458 (15%)	166 (6%)	341	232 (68%)	76 (22%)	33 (10%)

Grade I (100–90%) comprises wounds healed by first intention, or wounds which are dry 14 days after suture, but in which a small part of the wound or a stitch hole or a penicillin-tube hole is healing under a scab. Care has been taken to include none but proven cases under this heading.

Grade II (89–50%) comprises wounds which have healed for the greater part, but in which there is some gaping or a discharge (perhaps through stitch holes) of serum or pus. Most of these will heal spontaneously within a short time, or will need help from a patch skin graft.

Grade III (under 50%) are regarded as failures. Most of them are, however, only relative failures: few broke down completely.

It will be seen that of the cases treated by delayed suture, 10% were fractures, whereas of the cases treated by secondary suture 20% were fractures. This is because a higher proportion of fracture cases are unsuited for delayed suture and because there is a slightly higher proportion of failure of delayed suture in compound fractures, secondary suture being frequently attempted when delayed suture has failed.

A successful delayed suture looks its best a few days after the stitches are removed. As the weeks pass, the scars, particularly of the larger wounds—e.g., in triradiate scars of the buttock—often develop a good deal of keloid formation and [illegible] Often the epithelium gives [illegible] of scars, or over the fibr[illegible] passage of the missile. Such scars are very troublesome; they may almost indefinitely delay a patient returning to his unit in category A. Some of these are now being subjected to a further excision of scar tissue, with immediate repair.

[illegible] wa[illegible] for [illegible] buttock were the most intractable. "Suturability" of wounds may of course be influenced considerably by their anatomical situation, and this table deals only with wounds that have been sutured.

TABLE II—DELAYED PRIMARY SUTURE OF 1000 WOUNDS

	Total	Grade I	Grade II	Grade III
		100–90%	89–50%	Under 50%
Foot	28	22 (78%)	3 (11%)	3 (11%)
Leg	195	153 (79%)	24 (18%)	18 (9%)
Thigh	306	321 (75%)	48 (16%)	27 (9%)
Buttock ..	74	51 (69%)	14 (19%)	9 (12%)
Trunk	110	85 (77%)	85 (14%)	10 (9%)
Shoulder ..	54	48 (88%)	3 (6%)	3 (6%)
Neck	8	8	0	0
Upper arm ..	130	91 (70%)	30 (23%)	9 (7%)
Forearm ..	70	54 (77%)	9 (13%)	7 (10%)
Hand	16	11	4	1
Head	9	8	0	1

Remote results.—It is too soon to speak of the future of these wounds, especially of the larger ones in which there has been a fracture. I do not doubt that many will be complicated by abscess formation—perhaps months or years after suture. But this is a common legacy of the war wound, whatever the original treatment.

COMMENTARY

Under ideal conditions, these results could be very greatly bettered, but ideal conditions never occur in war. If they did, there would be no problem in the treatment of war wounds, and primary suture could be used: a two-stage operation would be rarely needed. It is in fact against the conditions created by war that we are constantly battling in surgery, and to achieve success with delayed suture, the rules enunciated here should have strict compliance. One fact that shows up plainly is that the risk of closing fractures has in the past been exaggerated. Provided the rules are obeyed, they may be closed as fearlessly as flesh wounds. And they should be closed as fearlessly, for their need is greater: sepsis established in a bone usually comes to stay.

SUMMARY

1. The standard treatment of wounds of both flesh and bone (face and head excepted) in the Italian theatre of war is a two-stage operation.

2. Certain rules must be obeyed if a high measure of success is to be achieved and disasters avoided.

3. The results of the two-stage operation in 3435 wounds so treated during September and October are recorded, together with the results in 410 wounds treated by late closure (secondary suture).

My thanks are due to [illegible] [illegible]tgill, OBE, MC, KHS, Dir[illegible] [illegible]ree Headquarters, for [illegible] [illegible] to Lieut.-Colonel Harold Rodgers, OBE, for helpful criticism. I am also indebted to Major-General D. C. Monro, CBE, KHS, and Brigadier Hugh Cairns and Brigadier Charles Donald, OBE, for helpful criticisms.

THE POLICY OF DELAYED SUTURE

RÔLE OF THE FORWARD SURGEON

F. A. R. STAMMERS, BSC, CH M BIRM., FRCS
BRIGADIER; CONSULTING SURGEON AAI, CMF

DELAYED suture was practised during the latter half of the last war. It has come into use again during the past eighteen months and in Italy conditions have been favourable to its employment on a large scale. Results are extremely gratifying, for with the advent of penicillin a much higher proportion of successes is obtained than in 1917.

One day a paper will be written on "the influence of Time, Terrain, and Type of warfare on the treatment of wounds," for much of the controversy surrounding wound treatment results from failure to appreciate that different conditions may demand different forms of treatment: no one form has a monopoly of perfection under all circumstances. What is right for the desert may be wrong for cultivated countries; what is possible in static warfare may be quite impossible in a war of movement; the case of 6 hours' standing can be treated differently from one of 3 days' standing; what is good in bullet wounds is insufficient in wounds caused by ragged fragments of metal.

The conditions necessary for a general policy of delayed suture to be successful are:

1. Adequate forward surgery appropriate to the terrain.
2. Short lines of evacuation with base hospitals within a few hours of the advanced surgical centres. (Cases must reach the hospital at which the suture is to be performed not later than the 3rd or 4th day after the primary operation.)
3. A group of surgeons at the base fully alive to the possibilities of delayed suture and organised accordingly.

1914–18

In order to understand the rationale of the present technique of wound treatment as practised in the forward areas of Italy brief reference must be made to the experience of the last war.

At first the surgeons of 1914, having little more than the records of the South African War to guide them, were bewildered by the appalling sepsis with which they were confronted in Flanders. (Anthony Bowlby declared that he was going home to study the records of the Crimean War!). By painfully acquired experience they learned that it was necessary to lay wounds wide open, to remove all foreign material that was readily accessible, and to incise deep fascia as a decompressive measure. By 1916 such men as Henry Gray, Rutherford Morison, and Carrel were performing secondary sutures. Then came the researches of Shaw Dunn and others showing that gas-gangrene was a specific infection of devitalised muscle; and on this basis surgeons began deliberately to remove all dead muscle. Later the importance of the time-factor was appreciated and surgical organisation was directed towards getting the patient to the surgeon within 8 hours.

Surgery was at its height in the latter part of 1917—i.e., when the war was static and lines of evacuation were short. (Some patients were in London within 12 hours of wounding.) By this time delayed and even primary sutures were being performed. There were no sulphonamides and no penicillin—surgeons relied on such antiseptics as hypochlorous acid (Dakin), iodoform (BIPP of Rutherford Morison), permanganate of potash, and salicylic acid, while other agents such as salt bags (Gray), soap solution (Haycraft), hypertonic glucose (Beckwith Whitehouse) were all tried. Gray insisted on splinting and drainage, and all came to realise that cases must be held until stitches had been removed. Once the war changed to one of movement, as it did in 1918, results were less good largely because the time-factor could no longer be respected.

THE PRESENT WAR

These facts explain why the policy of delayed suture has been slow to develop in the present war. Up to about May, 1940, casualties in France were few, and although wounds behaved much as they had done in 1914 and were being treated according to the technique of 1917 the small numbers made any set organisation for delayed suture unnecessary; and when the German offensive came things moved so rapidly that there was no chance for delayed suture even if it was considered.

Then came the experience of three years in the desert, where lines of evacuation were of [illegible] the time-lag made delayed sutur [illegible] On the rare occasions when hospit [illegible] few surgeons did actually emplo [illegible] were few, and for most young sur [illegible] if not unknown art. With the [illegible] suture out of mind the need for d [illegible] to producing a wound that would be ready for suture in 3–5 days' time did not arise. Nevertheless a change of thought was taking place. It was realised that wounds did not become so foully septic, and that gas-gangrene was not so common, as on the soil of Flanders, and a technique of trimming and of fascial incision for decompression became the one of choice: the old "excision" was condemned as mutilating. The satisfactory results were largely attributed to the new sulphonamides: but there was no general policy of routine stitching of wounds 3–5 days after th [illegible] —usually they were just allowed to [illegible]

The influence of climate and terrain is very significant here. Compare the soldier wounded in France—wearing a dozen thicknesses of clothing soaked in rain, and boots and gaitered trousers impregnated with the liquid mud of a highly cultivated country—with the soldier wounded in the desert, stripped to the waist or wearing only a thin open shirt and shorts, exposed to the sun and fighting in the barren sand. It is these factors far more than the sulphonamides that led to th [illegible] and that made a less radical [illegible] the spreading cellulitis an [illegible] be seen in Italy.

In the North African campaign conditions much more nearly like France obtained—a cultivated country, rain, mud, and cold. Surgeons naturally adopted an "excision" rather than a "trimming" technique, and a few carried out small numbers of delayed sutures.

Then commenced the Sicilian and Italian campaigns, and the surgeons of 1st and 8th Armies met, the former already experienced in wound behaviour in cultivated countries, the latter for a much longer period having worked in the desert where they had developed a technique suitable to that terrain. It is small wonder that there were differences of opinion. But wounds in Italy did behave differently from those in the desert. "Wounds are behaving just as they did in France," wrote one experienced surgeon who had served there as well as in Gibraltar and North Africa. It was not very long before all surgeons became more radical.

After the winter quietude the stage was set for the new offensive commencing May 11, 1944, and almost for the first time since 1939 conditions were ideal for delayed suture to be adopted as a routine:

1. Forward surgeons had learned the best way of treating wounds in Italy.
2. They had adequate supplies of penicillin.
3. There was a narrow front with short lines of evacuation along good roads.
4. Base hospitals were within 3 hours of the advanced surgical centres.
5. Base surgeons were fully alive to the advantages of delayed suture and organised accordingly.

The results have been most encouraging and it is no exaggeration to say that several thousand men have been returned to duty much earlier than they would have been without delayed suture, and that large numbers who otherwise would have been placed in category C or even D have been retained in the higher categories.

Frequent liaison between forward and base surgeons has led to minor changes in forward procedure. The kinds of question asked are:

1. Which mode of skin preparation appears best?
2. Is a solitary insufflation of penicillin at the time of operation of benefit?
3. Which method of treating through-and-through wounds gives the cleanest wound?
4. What is the best day for delayed suture?

And the base surgeons give their views. Forward surgeons contribute by such information as:

1. Stitches and ambulance journeys are incompatible.

2. All soft-tissue wounds are best splinted for the journey. When muscle is involved splinting is essential, and it should include the joint below.

PROCEDURE IN FORWARD AREA

The following technique is now employed by all

of skin and wash it with
some such antiseptic as

Remove only the pulped or frayed edge of the skin; the skin wound must be extended by incisions long enough to allow retractors to be inserted to the full depth of the wound so that it can be fully inspected. Excise any dirty fat or fascia and cut off any tags of fascia. Remove all muscle that does not bleed or does not contract when cut (imperfect removal of devitalised muscle carries the risk of gas-gangrene, and in any case leads to sepsis and hence to a wound unfit for early suture). Remove any pieces of bone that have no periosteal attachment. Remove any indriven clothing, equipment, or dirt, and any fragment of metal that is readily accessible. Lay open all nooks and crannies in which pockets of pus may collect. Make generous incisions into the deep fascia, transversely as well as

or proflavine—an antiseptic in which many gained justifiable faith in peace-time traumatic surgery. A dressing of sulphanilamide paraffin gauze is applied, but no packing and no stitches are permitted.

One need not be afraid of making a long incision: it can be closed at the base, and indeed it is easier to suture than a circular hole. Adequate incision is particularly important where there is a deep and extensive muscle wound lying beneath a small wound of entry. Where a through-and-through wound is superficial it is best to join the two together, but where it transfixes deeply—as through the quadriceps or deep to a vascular bundle—each wound should be treated separately as above.

For major muscle wounds (buttock, thigh, calf, axillary folds) a three-day course of penicillin, either intramuscularly or by glucose-saline drip is given. The dose is 15,000 units three-hourly. There is no doubt that penicillin has contributed to reducing the mortality of gas-gangrene, though efficient forward surgery will always be the first line of defence.

An essential part of treatment is adequate splinting. Quite apart from fractures, every wound involving muscle should be splinted, the best form being a plaster back-slab or a light cast; it should include the joint below, for otherwise the patient travels in pain and the wound is pulled on by the irregular movements of the ambulance. Experience shows that Cramer wire is too springy to give comfort during travel over rough roads.

Finally, after operation the wounds should not be inspected until the patient has reached the theatre of the hospital at which suture is to be performed. In the absence of pain and toxæmia any exposure of the wound at staging posts is meddlesome and will certainly lead to superimposed infection.

The above technique is applicable in all wounds, whether of the limbs (with or without fracture), the chest wall, the back, or the axilla. The flaps of amputation stumps are left open: even two guiding stitches are likely to result in accumulation of clot which in turn is a source of sepsis.

SPEED OF EVACUATION

If there be any who would criticise the general management of wounds in forward areas it must be remembered that the traumatising effect of the subsequent ambulance journey over rough roads dominates the activities of an advanced surgical centre and to a large extent dictates what forward surgeons may or may not do.

A fundamental fact in the policy of delayed suture is that the suture must be performed not later than the 3rd to 5th day. The responsibility of getting patients back to the base hospitals rests with the forward units, and it means that patients should arrive not later than the 2nd to 4th day.

Here difficulties arise, for in this moving warfare lines of evacuation are stretched and uncertain, and it is not always possible to deliver patients to the base in under a week. Forward hospitals dare not undertake their own delayed sutures unless they can hold the cases for at least 10 days, which may be impossible in times of stress; and stitches and ambulance journeys are incompatible.

TREATMENT OF BATTLE WOUNDS

TWO-STAGE OPERATION

W. M. CAPPER, MB LOND., FRCS, MRCOG
LIEUT.-COLONEL RAMC

At a forward base hospital in Italy during the six months ending September, 1944, 2024 battle casualties were received and 1202 operations performed for delayed primary suture. Most of the cases had multiple wounds; so one operation might involve the suture of two, three, or more wounds—in one case of thirteen.

For success two factors are essential: (1) early adequate planned decompression of the wound at the initial operation forward, and (2) facilities for early transportation of the wounded man to a centre where definitive surgery is possible and where he can be retained for 10 days or more.

It has been our policy to examine all wounds in the theatre on the day after arrival. The reparative operation seems to have its best chance when done as soon as possible after the 3rd day from the initial surgery. The benefit of early operation outweighs the advantage of any preparation beyond 24 hours' painless rest and adequate fluid intake.

Attention should be paid at this stage to the condition of the blood. A hæmatocrit estimation by the copper sulphate method is
e blood can
be taken as a routi
the theatre
after induction. C
of serious
wounds examined
day after
wounding, 76 (41%) had a hæmatocrit below 35%, although the majority had been given one or more pints of blood at the time of the initial surgery. The packed-cell volume should be maintained above 35% in all cases by transfusion of fresh blood till the epithelial barrier prevents further protein loss.

SOME POINTS IN TECHNIQUE

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nparatively few of
reat benefit where
suture of multiple wounds is attempted.

Repair.—Care over accuracy of suture and skin approximation is amply repaid. Fine sutures of silkworm gut closely placed give the best results, and where the skin edges cannot be straightened, vertical mattress sutures or a pulley-stitch are of special value. Deep tension sutures over buttons may be used with advantage, especially in buttock wounds, where maintenance of apposition of the deep tissues is difficult. A certain amount of tension may be allowed according to the area being sutured: in the arm and thigh, for instance, where the underlying œdema will soon respond to elevation. Over the scapula, great trochanter, and the subcutaneous tibial surface, on the other hand, tension will certainly result in wound breakdown. Buried sutures are for the most part unnecessary, and better avoided.

Dead space is unavoidable in many of the wounds. If it is deeply situated, the best course is to introduce a penicillin tube with dependent drainage. By the 7th day, when the tube is removed, most of the space will have been obliterated by the fast-growing hæmorrhagic granulation tissue that forms in the presence of penicillin. The hole for the drainage-tube can then be sutured if necessary. Superficial dead space is a more difficult problem. Tentage of the space with an epithelial bridge is almost certain to fail. It is best either to rotate a skin-flap to fall into the underlying hollow, or to suture the skin edges to the shelving walls of the gap and cover the intervening space with a split-skin graft. It is important to pay close attention to general principles as to viability when swinging a flap for this purpose. Union of the original or marginal skin of a wound is the best possible cover; but where this is not feasible it has been our aim to apply a skin-graft to the denuded area at this stage when the fresh muscle surface gives a greater likelihood of take.

Immobilisation.—The importance of a firm pressure bandage, of absolute fixation of the part in the plaster, and of elevation, cannot be exaggerated. Plaster back-slabs, with additional side-slabs as necessary, fixed with wet open-wove bandages, have proved more satisfactory than circular plaster if (as is usual) the wound is to be inspected 5 days later.

CONTRA-INDICATIONS

Contra-indications to suture are surprisingly few. The most common are:

(1) *Established infection.*—The usual picture is that of skin with red edges exposing tense hæmorrhagic muscle bulging through the wound in an œdematous area. Such a wound must be further decompressed, and the part must be splinted and elevated for 5 days, after which secondary suture may or may not be possible.

(2) *Incomplete wound excision.*—Occasionally wounds arrived which still contained pieces of clothing, and other kinds of foreign bodies and dead tissue. These need further excision. Suture will probably be possible in 5 days.

(3) *Involvement of a blood-vessel.*—In a wound where a large blood-vessel may have been damaged, and where it is impossible to ensure absence of sepsis, suture may be the prelude to secondary hæmorrhage: it has occurred in 3 cases in this series, and in each of them a low-grade infection was present in a wound where the femoral artery was involved. This figure may not be significant, and quite possibly hæmorrhage would have occurred in any case; but in our experience secondary hæmorrhage has been rare in such wounds when allowed to drain.

(4) *Joints.*—Where a joint is open in the wound it is best to attempt closure of the capsule or its adjacent structures and to wait 5 days before closing the overlying skin.

RESULTS

Over 85% of the wounds have epithelial cover on the 14th day after suture. The scars are healed, firm, and dry. While resolution of the lesion in the deeper tissues may take weeks or months, loss of tissue fluid and infection are prevented, and the improved general condition of the patient is manifest.

All wounds are worth suturing, however trivial; indeed small wounds are the most important from the point of view of economy of man-power.

The scars following suture are more supple and less adherent than those that follow granulation. A comparison of 58 thigh wounds selected at random from convalescent depot records shows that the average time away from duty was 104 days for unsutured wounds, and 88 days for sutured ones. This is too small a figure to be convincing; but it is noteworthy that 90% of the men with sutured wounds returned to duty in category A1, compared with 54% of those whose wounds were not sutured.

On an average, superficial flesh wounds are fit for the convalescent depot at the end of the 3rd week, and the more extensive wounds, with deep muscle laceration and tracks, at the 4th to 6th week, according to the degree of skin loss.

Except for the hæmorrhage mentioned above, no serious complications arose in the 1202 consecutive cases [illegible] urgeons.

This report records the work of a whole division and the conclusions were reached by frequent discussion both in the [illegible] and in the wards. If I mention the names of Major Barbara Stimson and Major John Ryder it is not that I am unmindful of the work done by sisters, medical officers, other surgeons, and specialists. I must thank Colonel M. J. Whelton for permission to publish and Brigadier H. C. Edwards for encouragement.

WOUNDS OF SOFT TISSUE

TWO-STAGE TREATMENT

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LIEUT.-COLONEL RAMC

THE cases reviewed cover approximately a year, divided into four distinct periods: (*a*) before penicillin became available; (*b*) January to March, 1944, when cases were received direct from forward medical units and early suture was possible; (*c*) April to August, 1944, when most of the wounded were received from other hospitals on the opposite coast of Italy; and (*d*) September and October, 1944, when cases were received direct by air or other means from the casualty-clearing stations.

To facilitate description the wounds have been divided clinically into two classes: (1) "clean" wounds which had been cleanly excised and had no necrotic tissue, no obvious sepsis (or very little), and no surrounding induration, tension, or inflammation; and (2) "septic" wounds which did not conform to these clinical standards. During the pre-penicillin period 29% of soft-tissue wounds were considered suitable for suture. In the first penicillin period just over 26% were regarded as "clean," and a further 30%, regarded as "septic," were also sutured. In all during the first penicillin period 56·3% of wounds of soft tissue were sutured.

Healing standard 1.—Healing solidly like a clean operation scar by the 14th day.

Healing standard 2.—Wound surface slightly moist with thin seropurulent discharge about 6th–10th day but healing complete in 16 days with slightly more scar tissue than in standard 1.

Healing standard 3.—Wound as in standard 2 but with gap not fully healed up to 1 in. long in 14 days. Healing complete in 24 days.

Healing standard 4.—Up to half the wound breaking down.

Healing standard 5.—Over half the wound breaking down.

RESULTS OF SUTURE

In all 71 wounds were sutured using sulphanilamide powder, with 62% of satisfactory results (table I). The average stay in hospital of patients without other lesions was 22·7 days.

TABLE I—SUTURE OF WOUNDS WITH SULPHANILAMIDE POWDER

Days between excision and suture	No. of wounds	Healing standard				
		1	2	3	4	5
2–5	52	22	11	9	1	9
6–10	16	5	4	2	3	2
Up to 10	68	27 (39·7%)	15 (22%)	11 (16·2%)	4 (5·9%)	11 (16·2%)
Over 10	3	1	1	0	0	1
Total..	71	28 (39·4%)	16 (22·5%)	11 (15·5%)	4 (5·7%)	12 (16·9%)

Table II shows the results in 110 "clean" wounds which were regarded as comparable clinically to those in table I, but were treated by suture with one insufflation of calcium penicillin and sulphathiazole powder. Success was attained in 103 (93·6%) and there were no real failures.

It is noteworthy that with suture up to 10 days after primary excision 96·8% were entirely successful, and after 10 days the number of cases healing in lower categories substantially increased. For those sutured more than 10 days after excision the stay in hospital was 24·3 days, compared with 17·6 days for those sutured earlier.

TABLE II—SUTURE OF "CLEAN" WOUNDS WITH PENICILLIN POWDER

Days between excision and suture	No. of wounds	Healing standard 1	2	3	4	5
3–5	25	21	3	1	0	0
6–10	38	34	3	1	0	0
Up to 10	63	55 (87·3%)	6 (9·5%)	2 (3·2%)	0	0
Over 10	47	34 (72·35%)	8 (17%)	5 (10·65%)	0	0
Total..	110	89 (80·9%)	14 (12·7%)	7 (6·4%)	0	0

These results were so striking that suture with penicillin was extended to "septic" wounds (table III). Even without selection the results of the penicillin cases (table IV) are much better than those treated with sulphanilamide.

TABLE III—SUTURE OF "SEPTIC" WOUNDS SUTURED WITH PENICILLIN POWDER

Days between excision and suture	No. of wounds	Healing standard 1	2	3	4	5
Up to 10	35	17 (48·6%)	8 (22·9%)	3 (8·6%)	5 (14·2%)	2 (5·7%)
Over 10	73	41 (56·2%)	11 (15·1%)	9 (12·3%)	10 (13·7%)	2 (2·7%)
Total..	108	58 (53·7%)	19 (17·6%)	12 (11·1%)	15 (13·9%)	4 (3·7%)

As more penicillin became available it was decided to perform suture, with penicillin-sulphathiazole powder, in every possible case: where wounds were considered unsuitable for closure they were to be made ready for it as soon as possible. In our second penicillin series therefore almost every wound of soft tissue was sutured; but during this period most of the cases were received later and had been dressed between their primary wound treatment and admission to hospital. The results are in table V.

TABLE IV—ALL WOUNDS: FIRST PENICILLIN SERIES

No. of wounds	Healing standard 1	2	3	4	5
218	147 (67·4%)	33 (15·1%)	19 (8·7%)	15 (6·9%)	4 (1·9%)

The figures show a general improvement, almost certainly because of wider experience in the technique of wound suture and greater use of local therapy to make the wounds suitable for suture. During this period also the hospital experienced one of its quieter intervals and individual consideration could be given to every case—238 wounds of soft tissue sutured in approximately six months. It is significant that no case remained in hospital because of chronic sepsis from soft-tissue wounds.

The results were [illegible] period, during the rush of [illegible] and was sutured as a delibe[illegible] of 357 cases thus treated within about five weeks, 64 had to be evacuated before healing could be assessed: these were for the most part the smaller clean wounds. At times penicillin powder was in short supply and 23 clean wounds were sutured with sulphanilamide powder (with 5 failures), and 23 with proflavine-sulphathiazole powder (with no failures). The remaining 217 cases treated with penicillin-sulphathiazole powder constitute our third penicillin series (table VI). The average stay in hospital of 159 patients without other lesions was 21·4 days.

Thus tables IV to VI show that 673 wounds were sutured with penicillin-sulphathiazole powder. The failures numbered 53 (29 in standard 4 and 24 in standard 5), i.e., 7·9%.

TABLE V—ALL WOUNDS: SECOND PENICILLIN SERIES

Type of wound	Days between excision and suture	No. of wounds	Healing standard 1	2	3	4	5
Clean	Up to 10	67	59 (88%)	6 (9%)	1 (1·5%)	0	1 (1·5%)
Clean	Over 10	63	54 (85·7%)	8 (12·7%)	1 (1·6%)	0	0
Clean	All	130	113 (87%)	14 (10·8%)	2 (1·5%)	0	1 (0·7%)
Septic	Up to 10	40	26 (65%)	5 (12·5%)	8 (20%)	0	1 (2·5%)
Septic	Over 10	68	36 (53%)	12 (17·7%)	9 (13·2%)	3 (4·4%)	8 (11·7%)
Septic	All	108	62 (57·5%)	17 (15·7%)	17 (15·7%)	3 (2·8%)	9 (8·3%)
All types	Total ..	238	175 (73·5%)	31 (13%)	19 (8%)	3 (1·3%)	10 (4·2%)

Large wounds which could not be brought into apposition without residual tracks or cavities, or which could not be made completely free from necrotic tissue, were sutured by the penicillin instillation technique. The results are summarised in table VII.

TABLE VI—ALL WOUNDS: THIRD PENICILLIN SERIES

Days between excision and suture	No. of wounds	Healing standard 1	2	3	4	5
Up to 10	185	134 (72·45%)	19 (10·3%)	13 (7·0%)	10 (5·4%)	9 (4·85%)
Over 10	32	18 (56·3%)	7 (21·9%)	5 (15·6%)	1 (3·1%)	1 (3·1%)
Total ..	217	152 (70%)	26 (12%)	18 (8·3%)	11 (5·1%)	10 (4·6%)

The large proportion in standard 3 is explained by the fact that on a number of occasions the rubber tube was inserted through the wound. It is better to insert the tube or tubes through separate stab incisions.

In all, penicillin has been employed as a bacteriostatic in the closure of 721 wounds with only 8·0% of failures. It is obvious that the faith of surgeons in CMF in this method of dealing with soft-tissue wounds has been justified, and the treatment has come to be conceived as a two-stage procedure—the primary wound excision or toilet and the wound closure.

TABLE VII—WOUNDS TREATED BY PENICILLIN INSTILLATION

No. of wounds	Healing standard 1	2	3	4	5
48	20 (41·6%)	7 (14·6%)	12 (25%)	3 (6·3%)	6 (12·5%)

POSSIBLE DANGERS

The following complications of suture may be encountered:

(a) Infection, as shown by systemic signs, is rare. It should not occur if the wound is thoroughly reviewed.

(b) The suture of a puncture wound without thorough exploration is unwise, and if any doubt exists a tube should be introduced for penicillin instillation. In one case a neck wound was sutured with penicillin powder and injury to the clavicle at the lower end of the long track was not spotted. The wound healed well but bone infection became obvious a fortnight after suture.

(c) In 3 cases foreign bodies had not been noticed and abscesses developed in relation to them although the wounds had healed.

All these complications can be minimised by thorough wound inspection.

SUMMARY AND CONCLUSIONS

(1) Penicillin as a local bacteriostatic has so revolutionised the delayed closure of soft-tissue wounds that the two-stage method has become firmly established as the best form of therapy.

(2) Of 721 wounds sutured with penicillin powder or penicillin instillation, only 62 (8·6%) have been considered failures.

(3) Success depends first and foremost on adequate primary surgery. No bacteriostatic, however effective, must be allowed to replace thorough wound excision, and the results of the two-stage treatment are a tribute to the work of the surgeons in the forward area.

The cases reviewed were treated in the surgical division of a general hospital by a succession of surgeons. Majors W. R. Merrington, J. R. Stead, and H. S. Shucksmith, RAMC, and Captain L. A. French, USMC, have been attached for varying periods, and Captains J. R. Rickett, E. P. Clarke, A. Tudor Hart, A. E. O'Donnell, L. H. Crosskey, and E. D. V. Nicoll, to all of whom I should like to express my thanks. As the only member of the surgical staff who has been with the hospital during the entire period, I must be considered responsible for the opinions expressed. I am indebted to Colonel J. D'A. Champney for permission to quote from the hospital records.

It is a pleasure to acknowledge the help and inspiration all surgeons in CMF have received from Lieut.-Colonel J. S. Jeffrey, until recently officer commanding the penicillin control unit. His pioneer work, particularly in the instillation technique, and his enthusiasm, went far in the early days to convince the sceptical. His is the original work and we have merely carried out his methods on mass-production lines.

ADMINISTRATION OF PENICILLIN BY MOUTH

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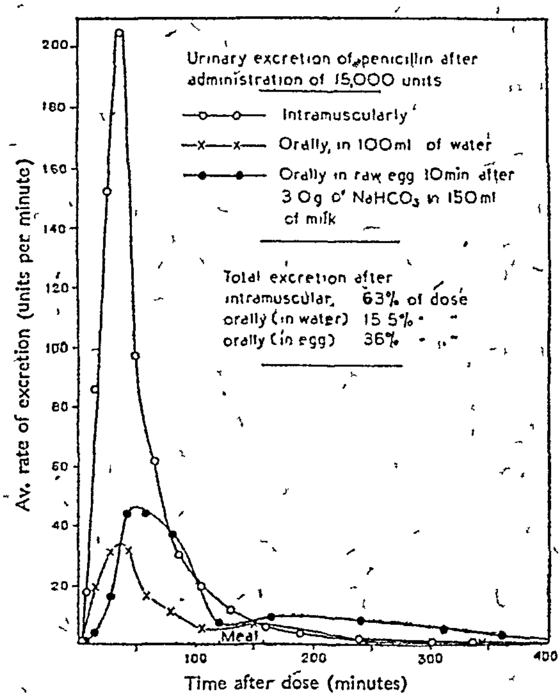
In their recent communication Little and Lumb (1945) reported among other findings that penicillin mixed with certain protecting media, notably raw egg, could be effectively given by mouth, and that 75–80% of the amount swallowed was excreted in the urine. This considerable return of penicillin in the urine is as large as or larger than that usually found after intravenous or intramuscular injection, and is far greater than that recorded for other methods of oral administration (Rammelkamp and Keefer 1943, Free et al. 1944, Rantz and Kirby 1944). It seemed of some importance to repeat these observations, particularly since Little and Lumb report levels in the blood approximating to those obtained after parenteral injection—indeed, their published curve shows a substantial blood level maintained for a remarkably long period.

METHODS

Four adult male subjects took the same kind of breakfast on each of 3 days, and 3 hours later received a dose of penicillin. On one day the procedure was substantially that followed by Little and Lumb; the dose of penicillin (15,000 units for subjects A, C, and D; 27,500 units for subject B) was taken in a beaten-up fresh egg made up to 100 c.cm. with tap water. This was preceded 10 minutes beforehand by 3 g. of sodium bicarbonate in 150 c.cm. of milk. On another day the same dose of penicillin was swallowed in 100 c.cm. of tap water. On the third day the same dose was injected into the deltoid muscle in 3 c.cm. of normal saline (except in the case of subject C, where the dose was injected in 4 c.cm. of distilled water). Pfizer sodium salt, batch 2054 (expiry date July 31, 1945), was used throughout.

Blood samples were taken at intervals, and their [illegible]ostatic power was examined by the drop-on-slide method (Garrod and Heatley 1944). Twofold dilutions were set up, but an attempt has been made at interpolation based on the number of colonies in the drops showing partial inhibition compared with the number in the control drops. The results have been expressed in terms of units per c.cm. by comparing with slides set up with closely graded falling dilutions of sera containing known amounts of penicillin. These results are semi-quantitative and comparative only.

All lots of urine passed during the 7–8 hours following the dose of penicillin were collected, their volume and pH were measured, and the pH was adjusted to 6·0–7·0 if outside this range. A small portion was taken for assay, shaken with a few drops of chloroform, and placed in the refrigerator at once. The urine samples were assayed in quadruplicate by the cylinder-plate method (Heatley 1944) within a few hours of being passed, and sometimes on succeeding days also, such replicate assays agreeing well. In every case the standard solution, in terms of which the penicillin content of the urine was expressed, was a portion of the same solution prepared for swallowing or injecting in that particular experiment; parallel tests against a reference standard confirmed that the actual potency of the material used was close to its assumed potency. Previous experiments on the reproducibility of the exact method used showed that the coefficient of variation for a single quadruplicate assay was 10% or less.



Rate of urinary excretion of penicillin after the same dose (15,000 units) given in three different ways to subject C.

RESULTS

The results have been summarised in tables I and II. In table II, showing the excretion each hour after the dose, the results from subject A have not been included because he had poor control over his functions and could usually obtain urine only at long intervals. From subject C, however, samples were collected every 5 or 10 minutes initially, and these results have been plotted on a graph (see figure). Each point on the graph indicates the average *rate* of excretion during the period of which it is the mid-point; the area under the curve therefore represents the *amount* of penicillin excreted.

DISCUSSION

It has long been known that though administration of penicillin by mouth is attended by losses greater than by the parenteral route, nevertheless a proportion of the material is absorbed into the blood and excreted in the urine. Now that penicillin is more abundant and is being produced more cheaply, the time may be approaching when the convenience of oral administration will more than compensate for the larger amount of the drug required.

TABLE I—PERCENTAGE OF DOSE EXCRETED AND BLOOD LEVELS AFTER PENICILLIN ADMINISTRATION BY DIFFERENT ROUTES

Subject	Units in dose	Mode of admin.*	Per cent. of dose excreted in urine	Concentration of penicillin in serum (hundredths of a unit per c.cm.) after						
				¼ hr.	½ hr	¾ hr.	1 hr.	1½ hr.	2 hr.	2½ hr.
A	16,000	Ow	4·2	—	—	—	—	—	nd	nd
		Oe	11·0	—	—	3	3	—	—	—
		Im	37·7	24	23	22	12	6	—	—
B	27,500	Ow	13·3	3	6	6	5·5	2·7	—	nd
		Oe	18·0	—	2 2	5	6	2	—	—
		Im	29·6	64	64	54	40	20	10	6
C	15,000	Ow	15·5	—	2·7	nd	—	nd	—	nd
		Oe	33·8	—	—	nd	6	3	—	—
		Im	63·0	43	35	27	18	10	2	—
D	15,000	Ow	4·3	—	—	—	—	—	—	nd
		Oe	15·5	—	2	6	6	3·5	—	nd
		Im	50·2	45	57	48	32	14	7	3·4

* *Mode of administration:* Ow, oral in water; Oe, oral in egg (taken 10 minutes after 3 g. sodium bicarbonate in 150 c.cm. milk); Im, intramuscular. nd, not done. —, less than 0 015 unit per c.cm.

[illegible] th [illegible] or [illegible] by [illegible] res[illegible] to assay technique, for from their graphs and tables it seems that solutions containing up to 25 units per c.cm., may have been used undiluted in the cylinder-plate assays. As these assays are usually performed, the curve relating diameter of zone of inhibition to concentration of penicillin becomes too flat for quantitative purposes beyond a concentration of 4–5 units per c.cm.; at higher concentrations a large change in strength of penicillin is accompanied by a very small average difference in diameter of zone. (On the same plate on which a solution containing 1 unit per c.cm. gave an average zone of 20·3 mm., one containing 5000 units per c.cm. gave a zone of only 15 mm.).

TABLE II—HOURLY EXCRETION OF PENICILLIN EXPRESSED AS PERCENTAGE OF TOTAL AMOUNT EXCRETED DURING THE 7 HOURS AFTER THE DOSE

Hour after dose	Hourly excretion of penicillin as percentage of total amount excreted								
	Oral, in water			Oral, in egg			Intramuscular		
	B	C	D	B	C	D	B	C	D
1st	46·1	53 4	55·8	26 2	27 1	23·9	34·4	71·6	51·8
2nd	36·8	22·1	28·6	41·3	32 6	16 6	41·7	21·4	33·0
3rd	6·4	15·6	10·9	14·1	15 9	10·4	15 0	4·8	9·7
4th	7·9	5·4	3·1	8·5	18 1	10·3	5 2	1·6	4·3
5th			1·6	8·6		6 5	1·8		0·6
6th	0 6	2·5	..		5 0	1·4	1·5	0 6	0·3
7th	0·2	1·0	..	1·3	1 3	0 9	0·4	<0·3	0·3

Subjects C and D received 15,000 units per dose; subject B, 27,500 units.

It will be seen, however, that the serum levels and the urinary excretion of penicillin are both considerably [illegible] rate of urinary excretion after the first 2 hours is notably higher after oral than after intramuscular administration, though no penicillin can be detected in the blood at this stage. A considerably larger oral dose might well maintain an inhibitory concentration in the blood for some hours. This point was investigated only to the extent of giving subject C a dose of 100,000 units in egg, after [illegible] the same conditions as before. [illegible] was excreted during the first [illegible] % during the next 4 hours. Penicillin in the blood reached a peak of 0 16 unit per c.cm. after one hour, fell to 0 06 unit per c.cm. at 3 hours, but was not detectable at 6 hours (i.e., less than 0 015 unit per c.cm.).

[illegible] e shown that during intra[illegible] e of urinary excretion of [illegible] blood level: but in these [illegible] is offered. [illegible] in each of the [illegible] 0 minutes was at first thought to be due to errors of assay, but was confirmed on re-examination. Such a temporary rise does not occur after intramuscular injection; it may coincide with hyperæmia of the gut following the light meal taken just before its occurrence.

In general the urinary excretion and blood levels reported here [illegible] ings of [illegible] (1944), [illegible] urinary [illegible] in these four cases than in [illegible] penicillin by mouth, with [illegible] may be effective in treating [illegible]

[illegible] suggested that [illegible] be tested by acc[illegible] rse of blood and [illegible] the [illegible] nical trial. It is [illegible] be found for oral [illegible] esent there is no [illegible] to believe that the necessary dose will not be greater than for the parenteral methods.

The graph was drawn by Mr. H. Axtell.

ADDENDUM

Since the above was submitted, the following papers dealing with this subject have become available:

Libby (*Science*, 1945, **101**, 178) found that 90,000 units of sodium or calcium salt suspended in oil and given by mouth in a gelatin capsule would maintain a measurable concentration of the drug in the blood for 6 hours, the peak level being 0 05 uni[illegible] but was [illegible]

McDe[illegible] p. 228) [illegible] levels in [illegible] beeswax, and in water after sufficient magnesium trisilicate given during the preceding 3 hours to bring the pH of the stomach contents to about 8 0. The average total urinary excretion was 12% of the dose with all four methods. Blood levels were followed for 2 hours only and were of the same order in each case, though it seemed likely that they would persist longer in the [illegible]) gave 20,000 [illegible] ith trisodium [illegible] 'Amphogel,' [illegible] excretion of [illegible] complete within 6 hours) was about 3% of the dose when given in water alone, and about 18% with citrate or phosphate, though [illegible] hours after breakfast. After fasting the average excretion was 12% of the dose in all cases. When the dose was taken after breakfast with suitable amounts of citrate the average excretion was 11% of the dose, compared with 5% obtained under similar conditions [illegible]

[illegible] the period of time during which it could be detected, in the blood. The blood levels obtained were of the same order as those reported by other workers.

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[illegible]

TIME OF OCCURRENCE OF SECONDARY FAMILIAL CASES OF INFECTIVE HEPATITIS *

ALLAN M. MCFARLAN, M B CAMB. & EDIN.

Frost (1938) pointed out that valuable epidemiological information is to be gained by the systematic collection of accurate information concerning multiple cases of infectious diseases in families. He used the method when studying the 1916 epidemic of poliomyelitis in New York (Lavinder, Freeman, and Frost 1918), and was able to compare his findings with those of Chapin (1925) relative to scarlet fever and diphtheria in Providence RI from 1884 to 1905.

The method may also provide an indication of the length of the incubation period. The only reliable method for the determination of the incubation period of an infectious disease is to record the period between the onset and a preceding short and only possible exposure, but opportunities of doing this are few. The intervals between successive cases in families give limits for the incubation period which are wider than the true period. This is partly because the second and later cases may be infected outside the family, and partly because infection may be transferred from one member of the family to another during at least some days before and after the date of onset in the infecting case. Despite these possible fallacies, the graph of the secondary familial cases of measles (fig. 3E) shows a second wave of cases at a time after the onset in the first case which corresponds broadly with the incubation period as determined from cases following short and only possible exposures. Such a secondary wave appears only in diseases which have a comparatively long incubation period and in which case to case spread in families is common. It was expected that infective hepatitis would prove to be a disease of this sort and data were collected from families.

METHOD

The data required are the dates of onset of infective hepatitis in successive cases in families. The date of onset, which as a rule precedes the appearance of jaundice by a varying period, can usually be determined accurately. In most cases the disease has an abrupt onset with anorexia, abdominal pain, nausea, and vomiting, and sometimes supra-orbital headache and shivering, while in a few cases dark urine or jaundice of the conjunctivæ may be the first abnormality. Even when the disease begins more insidiously with lassitude or indigestion, the true date of onset can be determined by careful questioning. Each family is considered separately. The date of onset of the first case is counted as day 1, and this primary case does not appear in the tables or charts. If two or more cases occur on day 1, one is considered to be the primary case and the other case or cases are credited to day 1. Later cases are credited to the appropriate day between 2 and 70 days after the onset. The limit of 70 days excluded only 4 later cases, 2 in the 40 Wensleydale families and 2 in the 121 other families.

RESULTS

Fig. 1A shows the days (after the onset in a first case) on which 66 later cases occurred in 40 families in Wensleydale from 1929 to 1943. These figures were extracted from the unique records kept by Dr. W. N. Pickles (1939). It is a pleasure to acknowledge his generous help and permission to publish these results. There are 9 cases on day 1, all of which occurred in 1929, and 9 more cases from the 2nd to the 18th day. The majority of these cases were probably "parallel infections" having been infected from the same source as the primary case. From the 21st to the 40th day there are 34 cases which are true secondary cases infected by the first case. This well-defined wave corroborates the evidence, derived from cases following a short and only possible exposure, of an incubation period of 20–40 days. Between the 52nd and 63rd days there are 13 cases probably infected by an intermediate case. This sequence of three waves demonstrates the "serial infection" frequently mentioned as a feature of epidemics of infective hepatitis.

Fig. 1B presents a graph of 59 secondary cases of mumps in 32 Wensleydale families. The secondary cases in this disease occur from the 11th to the 30th day, which is in accord with the incubation period of 15–18 days determined from short and only possible exposures.

Fig. 1

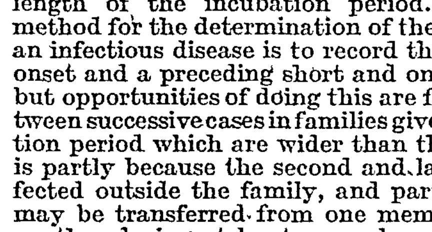


Fig 2

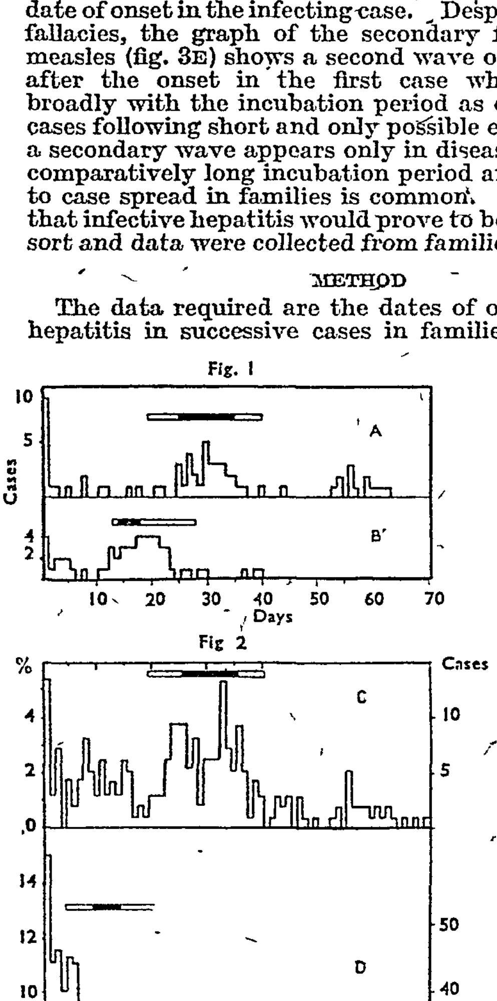
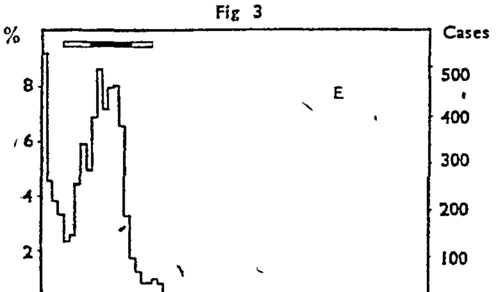


Fig 3



Daily incidence of secondary familial cases

A—Infective hepatitis, 66 cases, Wensleydale 1929–40
B—Mumps, 59 cases, Wensleydale 1935–42
C—Infective hepatitis, 241 cases, Great Britain 1929–44
D—Poliomyelitis, 407 cases, New York 1916
E—Measles, 5762 cases, Providence RI, 1917–23
F—Scarlet fever, 1899 cases, Providence RI, 1904–13

In each figure the bars indicate the limits of the incubation period from the date of onset of the first case. The commonest period has been blacked in

These Wensleydale figures show that useful information may be derived from a relatively small number of carefully collected cases. For comparison with published figures for other diseases it was desirable to have a larger series. It has been possible to collect 174 more cases of infective hepatitis following a first case in 121 families in other places.

Village epidemics were studied at Charlbury, Oxfordshire, in 1941 (8 cases: McFarlan 1941); and in 1943–44 in East Suffolk, at Bungay (22), Chelmondiston (17), Debenham (7), and Friston (8). In 1943–44, cases in cities and towns were collected in Norwich during an epidemic (12), and in Cambridge (11), Colchester (36), Edinburgh (25), and Watford (4) where sporadic cases were occurring.

The distribution of subsequent cases in days 1–70, dating from the onset in the primary case, is given in fig. 2C and in the table. Graphs have also been drawn from figures obtained for poliomyelitis (fig. 2D, Lavinder et al. 1918), measles (fig. 3E, Chapin 1925) and scarlet fever (fig. 3F, Chapin quoted by Lavinder et al.

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* A report to the Medical Research Council.

1918). Figs. 2 and 3 have been drawn by using as ordinates the percentage of the total subsequent cases occurring on each day, so that the area corresponding to the cases is the same for each disease. The smaller numbers of mean that are not so However, that there earance of subsequent cases in the four diseases.

DAY OF APPEARANCE OF 240 SECONDARY FAMILIAL CASES OF INFECTIVE HEPATITIS

Days	Week No.	Number of cases on day:							Weekly cases
		1	2	3	4	5	6	7	
1–7	1	13	3	7	0	4	2	4	33
8–14	2	8	5	3	6	3	4	3	32
15–21	3	6	5	1	2	1	3	3	21
22–28	4	3	6	9	9	9	5	8	49
29–35	5	2	6	6	6	13	7	6	45
36–42	6	9	5	1	4	3	0	1	23
43–49	7	3	2	3	0	3	1	0	12
50–56	8	1	0	0	1	2	0	5	9
57–63	9	2	2	2	1	2	1	2	12
64–70	10	1	0	1	0	1	0	1	4

The graph for infective hepatitis (fig. 2c) shows the same three waves as the Wensleydale graph (fig. 1A). The first wave of parallel infections is followed by a well-defined second wave, including 49·6% of the cases, between the 20th and 40th days. There are a small number of cases from the 41st to the 70th day infected by

The measles graph shows a definite second wave from the 8th to the 18th day, corresponding roughly to the incubation p and includu very small c of measles a

The scarlet fever graph shows a single peak, because the first wave of parallel primary infections is fused with the waves ases on account of the short collected figures for diphth very similar to those

The duration of the wave of secondary cases will be greater if there is much or if the duration of in lengthy. The second w taken in conjunction wit periods suggest that the measles and infective hepatitis.

SUMMARY

In families with more than one case of infective hepatitis the cases after the first occur in three waves. The first wave consists of parallel primary cases. The second wave occurs from the 20th to the 40th days, includes about half of all subsequent cases, and consists of cases infected by the first case. The small third wave consists of cases

This infectiv in mun diphthe infective incubation period of 20–40 days; (2) a short duration of infectivity; (3) a degree of infectivity in the family greater than that of poliomyelitis and less than that of measles.

Reg prac of d

References at foot of next column

Medical Societies

ROYAL SOCIETY OF MEDICINE

At a meeting of the section of urology on April 27, with Mr. F. McG. Loughnane, the president, in the chair, a discussion on the use of

Penicillin and the Sulphonamides in Urinary Disease

was opened by Wing-Commander J. C. Ainsworth-Davis, who reviewed the present position of sulphonamide therapy in urinary infections under (1) indications, (2) basic principles in their use, (3) dosage and mode of administration, and (4) complications and their treatment. He preferred sulphathiazole in acute and chronic coliform infections, but it was not effective in infections with *Bacillus proteus* and *Streptococcus fæcalis*, and its value in staphylococcal infections was doubtful. After a large initial dose the drug should be given four-hourly day and night for at least 2 days, after which dosage was gradually reduced. A white-cell count should be done before treatment was begun, and repeated on alternate days. Fluid intake should be 5 pints daily to ensure a urinary output of at least 2 pints. Alkalis were given because the sulphonamides were most effective and more soluble in an alkaline medium. There need be no restriction in the diet. He favoured doses of 1·0 g. four-hourly, the tablets being crushed and . Dosage, intake, and output daily. Complications which might occur were drug sensitivity (e.g., drug-rash and drug-fever), d oliguria or anuria fro in the kidney itself or and treatment of this las cussed. Large doses of at the oliguric stage; massage in the knee-elbow position, ureteric catheterisation, use of the speaker's ureteral corkscrew, or nephrostomy were the methods recommended for anuria.

Dr. Robert Cruickshank emphasised the value of laboratory control in the use of penicillin. In tration there was a tendency to return to intermit intramuscular injections: doses of 15,000–20 units 4 or 5 times a day were effective in the localised infections. The staphylococcal kidney ab which might be multiple or coalesce to a renal or lead to perinephric abscess, was very suitable penicillin therapy. It was usually secondary to a f elsewhere and had been common at the end of 1914–18 war when chronic osteomyelitis was prevale Staphylococcal cystitis, often a low-grade infection to the white staphylococcus and very resistant to forms of therapy, might also respond to fections should because of the tend ganisms responsible the commoner urinary infections—coliform proteus, pyocyaneus and *Str. fæcalis*—were among *penic* greatly t, with a dosage of 30 units per c.cm. were obtainable. Helmholtz in America had lately shown that *Str.* inhibited in vitro by a concentration of 3 units of cillin per c.cm. of urine at pH 7·0, *B. proteus* by 8 and coliform bacilli by 15–30 units: *B. aerogenes* pyocyaneus resisted concentrations over 30 units c.cm. Thus penicillin might prove beneficial in urin infections due to proteus and *Str. fæcalis* which sulphonamide therapy. Non-specific urethritis abacterial pyuria might also respond to penicillin. experience in the treatment of gonorrhœa, rather than local penicillin therapy was indicated in these infections.

In the discussion that followed, a number of speakers referred to the failure of sulphonamides in chronic urinary infections, and the need to deal

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with local infective foci; and emphasis was laid on obstructive factors or atony which led to urinary stasis. Prophylactic sulphonamides had proved very useful in preventing fever and infection following instrumentation. Sulphamezathine was recommended as less toxic and more soluble than sulphathiazole. Anuria need not be due to mechanical obstruction. The tendency to secondary infection with pyocyaneus and coliform bacilli after penicillin therapy was a common experience. It was doubted if a high urinary concentration of penicillin would reach the infecting organisms in the mucous membranes, but penicillin would not be inactivated by associated acid or alkali treatment since it was effective over a range of pH 5 to 8.

MANCHESTER MEDICAL SOCIETY

PHARYNGEAL DIVERTICULA

At a meeting of the society on April 4 Prof. John Morley read a paper based on his series of 21 patients with posterior pharyngeal pouches, and 2 further cases complicated by squamous epithelioma arising in the pouch. He showed that what was described by the late Sir Arthur Hurst as an anterior pharyngo-œsophageal pouch was merely barium lodged in the vallecula between the tongue and the epiglottis. The average age in Professor Morley's series was 60 years at the time of operation, males outnumbering females by more than 2 to 1. He discussed the differential diagnosis from carcinoma of the œsophagus, fibrous stricture, and cardiospasm, and stressed the importance of radiological examination, quoting one case where a pouch filled with food was mistaken on X-ray examination for an intrathoracic goitre. In discussing operative treatment he advocated primary excision of the pouch and suture of its neck in one stage rather than the two-stage procedure, which is followed by a fistula in 50% of cases. In his 21 pouches, all treated by one-stage resection, there were no deaths; 16 healed by first intention, 3 developed severe fistulæ, 1 a transient fistula, and 2 residual abscesses. Preliminary gastrostomy was only employed with large pouches in patients who appeared to be bad surgical risks.

THE GASTRO-INTESTINAL MUCOSA

Dr. F. Duran-Jorda, in a paper on some new histological facts concerning the gastro-intestinal mucosa, described what appeared to be a flat epithelial layer overlying the mucosæ of the stomach, small intestine, appendix, colon, and gall-bladder, and he supported the existence of this layer by finding capillaries in it. This layer was also found in fœtal stomachs and in several other mammalian stomachs. In studying the layer Dr. Duran-Jorda had used his own method of formalin vapour fixation. He touched briefly on the relation between this new layer and the histology of some lesions found in the stomach, intestines, and ulcerative colitis, illustrating each stage with coloured photomicrographs.

Reviews of Books

Health Instruction Yearbook, 1944

Compiled by O. E. Byrd, ed d, associate professor of hygiene and director division of health education, Stanford University. Foreword by C. Morley Sellery md. (Oxford University Press. Pp. 354. 18*s.* 6*d.*)

One of the perennial problems of the health educator is the content of his teaching. It is easy to utter banal generalities, yet these make little impression. One recalls a senior physician who once, to his horror, found himself addressing an audience of nurses thus: "The tongue is a wiggley organ. It woggles in and out of the mouth." Dr. Byrd has placed all health educators, medical and lay, in his debt by producing a really useful guide to current medical advance, and work in the field of social medicine. Though in theory a series of 305 abstracts, these are so arranged as to produce a continuous narrative, under such headings as nutrition, exercise and body mechanics, heredity and eugenics, habit-forming substances, family health, and occupational health. Every abstract is really informative and they include a large number of vital and other statistics. Though most of them relate to the United States, their interest is none the less considerable for British health teachers. The information supplied is catholic; thus the book records that: The country with the lowest crude death-rate in the world is the Dominican Republic, with New Zealand next; about 68% of all births in the United States take place in hospitals; the maternal mortality-rate in the United States is lowest in the age-group 20–24 years; the death-rates of married people, particularly married men, are substantially lower than of single people; less than 5% of American divorces are granted on the grounds of adultery; the Kenny method of treating infantile paralysis has now been very widely adopted in the United States; there is a Mormon family in Utah in which 41 achondroplasiacs have been born since 1833, and only 3 have so far died, at the ages of 61, 78, and 79; a statistical study of people over 50 showed that the factors mentioned as making for happiness in old age were (in order of frequency) good health, trust in God, a cheerful state of mind, money, friends, gainful occupation, pleasant relation with family, children, and grandchildren. With such a quarry to dig in, there can now be no excuse for dullness among health educators.

Principles and Practice of Ophthalmic Surgery

(3rd ed.) Edmund B. Spaeth, md. (Kimpton. Pp. 934. 50*s.*)

Routine operations of ophthalmic surgery for squint, glaucoma, and cataract have not changed much in the last decade; they are set down here in detail, and with all possible variations. Fair to all parties Professor Spaeth often gives his own experience and opinion only at the end, in brackets. All varieties of skin grafting and plastic surgery applicable to the eyelids are well described—corneal grafting by Castroviejo, and gonioscopy by Barkman. Every known technique for dealing with detached retina is recorded, but many of these described have no more than a historic interest in this country, and a few coloured plates in this section would have saved a mort of words.

The thoughts of most European eye surgeons today are directed towards the treatment of battle casualties. This book, by a civil surgeon for civil surgeons, is written far from the scenes of war. This does not detract from its great merits, but the surgeon seeking advice on acute injuries of the lids and globe will find the standard of the sections dealing with them below that of the rest of the book. Transscleral removal of foreign bodies is too lightly dismissed, and the immense possibilities of primary and delayed primary suture of the lids deserved a place in this useful text.

Your Doctor of the Future

H. H. Leeson, mc, mrcs. (Freer and Hayter. Pp. 32 1*s.*)

Dr. Leeson continues in this pamphlet his series of comments upon the future of the medical services He would be content, it seems, to accept the general structure of service suggested in the white-paper provided that the administrative machinery allowed full professional participation in the planning of the service, and that the terms and conditions of service were sufficiently attractive. He has given much thought to the details of administration, has prepared a comprehensive list of medical subdepartments which he considers would be necessary, and has shown how they could function both in central and local administration. Throughout the pamphlet he shows a greater readiness than most of us to enter into the discussion of detail. Sometimes this leads him into positions unacceptable even to those doctors who would agree with him in principle. For instance, many who would agree as to the need for health centres might not agree that there is a universal need for a type of centre as elaborate as is here described. Dr. Leeson is a little confusing in his section on remuneration, both for consultants and GP's. It is clear that he would personally prefer a salaried service for both, but he is willing to accept as an alternative (particularly for part-time service) a system of payment by what he calls capitation, but which is really not a capitation method, but a system of payment by item of service. Yet on the whole this is a useful pamphlet which will stimulate readers to formulate more clearly and in more detail, their own views on many controversial subjects.

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J. Immunol. 1943, 47: 493

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THE LANCET

LONDON: SATURDAY, MAY 12, 1945

Deliverance

For the nation victory in Europe ends a great peril and begins a great opportunity. We declared our war deliberately; we have taken grave risks; and those of us who have lost much have reason to be proud in their loss. Though the war is not over, we are delivered from danger, sufficiently to think of the future, and especially the future of the soldier. After the last war, our leaders spoke of "homes fit for heroes to live in." There was nothing wrong with this phrase, the heroism of millions was obvious then as it is now. All that was wrong was the failure to provide the homes—the failure to carry into peace the sense of equality and service gained in war. Today, in celebrating deliverance even more than victory, we are conscious of reaching a beginning rather than an end. We must remember Mr. CHURCHILL's saying that the test of a nation, as of a person, is what it can do when it is tired.

For medicine war has compensations. No-one can guess what has been missed through the interruption of research during the past six years; but the needs of the armies have promoted rapid advances in chemotherapy, resuscitation, and the control of epidemics which will be of immense value throughout medical practice. As expert and technician the doctor has played and must play a vital part in war—not least in the tropical warfare which still faces us. None the less, as recipient of a humane tradition, the doctor must revolt from war, which is the antithesis of what he stands for. To mend, as far as possible, the bodies that someone else has just intentionally maimed is an unhappy task for anyone who looks beyond the mere technique of his profession. Also, though the scientist may be content to use his knowledge for one side or another, the doctor cannot forget his obligation to all his fellow men—an obligation to heal, not to hurt. The end of the war in Europe means that we can and must return, if gradually, to the humanist tradition in medicine which formerly made it a civilising force.

For everyone the end of German resistance is an opportunity for helpful or harmful reactions. To decide which are helpful and which are harmful may sometimes be difficult, but at least it is wise to suspect any policy which its exponents will be unlikely to maintain through the coming years. We return to the problem, of which we wrote on Sept. 2, 1939, of the moral capacity to make a good peace, "remembering that the peoples of Europe will have to live as neighbours to the end of time." Those who have to deal with the disruptive force of German aggression will need, we suggested, a moral courage to face the evils in their own human nature. *Bis vincit*, said the ancients, *qui se in victoria vincit.*

Speaking to his peoples, the KING has defined their task. We shall have failed, he said, if victory "does not lead to a lasting peace, established on justice and established in good will." We must resolve "to do nothing unworthy of those who died for us, and to make the world such a world as they would have desired for their children and for ours."

The Colostomy

OLIVER WENDELL HOLMES used to tell his anatomy class that the integrity of society is dependent on efficient sphincters. And none will deny the misery that an incontinent anus, natural or artificial, may cause. It is largely the imagined lack of control about a colostomy which fills men's minds with horror. They picture a streaming fæcal swirl, or at best a constant dribbling, with the patient in a sorry mess. This erroneous idea has often led to the concealment of rectal growth, for the patient feels that if this is to be his end he may as well die. To the surgeon's eye the colostomy does of course seem a mess, and for many years the Paul-Mikulicz operation—despite its safety—did not find favour because it involved a temporary colostomy. As MAINGOT[1] remarks, patients commonly say, "I'll take the risk of your doing it in one stage; that is provided I don't die!" The idea has arisen from a general misconception of bowel action. HURST[2] pointed out, and HARDY recalled a fortnight ago, that the distal colon and rectum are normally empty, and only some four times a day at the most do we get a mass peristalsis whereby colon contents are passed down from the transverse colon to accumulate in the pelvic colon. The patient with a left iliac colostomy may thus expect a dry stoma for the major part of the day. The mass movement is activated by a complex conditioned reflex; it may be lighting a cigarette, drinking a cup of tea, reading the paper, taking a bath, or eating breakfast which brings it into action. The entry of food into the stomach—the gastro-colic reflex—is the usual trigger, but, like the digestive glands of PAVLOV's dogs, our bowel can be trained to obey the dinner bell instead of the dinner. The abdominal anus may be trained to develop its own conditioned reflex, and act but once or twice a day, more or less following the bowel habits of the patient in his pre-colostomy days. A large number of soldiers in this war have had colostomies for colon wounds. These have usually been temporary, and the patient has nearly always readily adjusted himself. The war casualty feels that he has "earned" it in a good cause, and the promise of subsequent closure buoys him up. But doctors, artists, labourers, even highest dignitaries of State have been able to carry on fully and normally at their work with a permanent colostomy. They learn to dismiss it from their minds, they look well, and as LANE remarked the colour and texture of their skin are often particularly healthy.

For the permanent colostomy there is no purpose in trying to make a "muscular" anus in the abdominal wall by bringing the bowel through the [illegible] or other muscle-fibres. If possible the colostomy should be made at the upper end of the pelvic colon loop, to lessen the chance of prolapse. A permanent transverse colostomy should be avoided for here there is constant leakage, and the patient may be very uncomfortable indeed. The ascending colon and hepatic flexure have been brought out in double-barrelled fashion for colon wounds [illegible] frequently within the last [illegible] the view that colon wounds [illegible]

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1. Maingot, R. [illegible] Proctology, Feb. [illegible]
2. Hurst, A. F. [illegible]

excoriation of the abdominal wall has proved troublesome in these cases, and wounds of the right side of the colon are now being more often treated by suture, with proximal cæcostomy. An end-colostomy is much to be preferred, and if this is not possible the loop should be completely divided. It is unnecessary to excise an ellipse of skin to prevent contracture around the stoma; this scarring is often determined by the sepsis following the operation. Coller and Ransom[3] urge that on no account should the end of the bowel be anchored to the abdominal wall or peritoneum by sutures. With distension or retraction of the bowel these sutures tear out, and secondary openings, which do not heal, develop at skin level. Opinion has varied on when the colostomy should be opened. Slive, Shoch, and Fogelson[4] have shown experimentally that between 12 and 48 hours after operation the colostomy wound is at its weakest. Between the 2nd and 5th days the colostomy wound shows no further increase in its tensile strength. It may thus be safely opened after 48 hours. A rather longer colon end is usually exteriorised these days, and the excess trimmed off later; the wound may be given a fuller chance to heal without soiling by inserting a decompression catheter, say 2 days after operation, to relieve distension.

An ileostomy, which according to Corbett[5] is the operation of surgical choice in ulcerative colitis, of course behaves very differently from a colostomy, but the bowel soon settles down to 3–4 actions daily, the contents become semi-solid, and they are largely free from fæcal odour. Cattell's[6] method, in which the divided loops are brought out through separate openings in the abdominal wall, is now commonly employed, and when ileostomy is practised at an early stage of ulcerative colitis it has been found possible to re-establish continuity later. The abdominal wall keeps remarkably well in these cases if an aluminium and zinc oxide paste or the buffered gel advised by Selous and Perryman[7] is first applied.

The surgeon who gives a patient an artificial anus should always find time to teach him how to manage it. Often such patients are sent home with but little preliminary practice and instruction, and the misery in the household while experience is being gained may then be intense. Gabriel[8] aims at getting patients to train their bowels to act shortly after breakfast and perhaps again towards the evening without regular enemas, which he says may lead to excessive production of mucus. The daily passage of a rectal tube into the colostomy by a layman is not without danger—perforations, almost all fatal, have been caused in this way—but most patients like to be sure that the bowel is empty before they go to work, and so prefer to give themselves a morning wash-out or enema. If fæces are passed again during the day the dressing will then be able to contain them. With a cup-and-tube apparatus the wash-out is a simple matter, though difficult to do away from home. Plain water should as a rule be used; nurses still have an affection for soap enemas, but these have no advantages over plain water and will almost certainly stimulate the bowel to secrete mucus to protect itself from the irritant. The use of turpentine Hurst and Hardy regard as a therapeutic sin, for it puts the bowel into tight spasm, and the mucosa appears red and angry. Colostomy bags and cups are rarely required, except in the rare cases where control cannot be attained and frequent loose stools are passed. A small celluloid plate or cardboard square between two layers of dressing, retained in position by a flat webbing belt, will satisfy most patients' needs and cope with all but the severest "accidents." For the "accident-prone," and those with transverse colostomy, Devine has devised a small balloon which is inserted into the bowel and then distended. Some such device, if it proves harmless to the bowel, might give the colostomy patient full confidence in his place in society. The ileostomy patient always needs a belt with a cup. Rubber cups suck on the bowel and cause prolapse, so Corbett has his cups of celluloid, made flat, shaped to the abdominal wall, and arranged to lie transversely so that patients do not push them up when they sit down. The cup must fit fairly close to the ileostomy opening, or there will be a strong tendency to herniation, as there is with all forms of colostomy or ileostomy "chute" which give the bowel no support.

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3. Coller, F. A., Ransom, H. K. *Surg. Gynec. Obstet.* 1944, 78, 304.
4. Slive, A., Shoch, D., Fogelson, S. J. *Ibid*, p. 525.
5. Corbett, R. S. Royal Society of Medicine (section of proctology), presidential address, Nov. 8, 1944.
6. Cattell, R. D. *Surg. Clin. N. Amer.* 1939, 19, 629.
7. Selous, C. F., Perryman, P. W. *Lancet*, Feb. 24, 1945, p. 240.
8. Gabriel, W. B. British Encyclopædia of Medical Practice. supplement, p. 11.

Discharged from Hospital

> "Unless we are prepared to furnish a qualified physician to pilot the medically needy patient suffering from chronic disease on his course after leaving the hospital, we shall continue to waste time, effort and many thousands of dollars by hauling him back to port for repairs each time he goes on the rocks."[1]

In 1930 the Syracuse University College of Medicine introduced a scheme whereby every student during his period of medical clerking made a complete study of at least one patient, including a personal investigation of the living and working conditions of the patient. The state of affairs thus brought to light was so unsatisfactory that the authorities appointed an extramural resident whose duties were to supervise the patients discharged from hospital. The Commonwealth Fund have now published a report[1] based on the findings of this scheme between July, 1940, and February, 1942, when 902 patients—i.e., all those admitted to the medical wards of the university hospital—were studied. After discharge from hospital 165 patients were supervised at home by the extramural resident, the remainder either attending the Syracuse Free Dispensary or their private doctors. Conditions in the United States are of course very different from those over here, which explains why home care had to be provided by the hospital for so many patients. It is the findings in this group that provide the most illuminating data. As a result of the careful supervision exercised on these patients their stay in hospital was shortened, their social and economic difficulties were lightened, their return to work (and the right type of work) was facilitated, and impending relapses were forestalled, thus preventing readmissions. In the words of the report: "beyond these medical benefits, there are many personal and intimate aspects of such a service which, though tangible, are real to the patients and contribute a sense of security and spiri-

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1. Jensen, F., Weiskotten, H. G., Thomas, M. A. Medical Care of the Discharged Hospital Patient, London, 1944, pp. 94. $1.00.

tual comfort." It was estimated that the scheme saved 7268 days of hospital care at a cost of $29,072; or, to express the saving differently, during the period of experiment it set free bed-space for 302 additional patients.

Lately two Oxford workers[2] in a report described by the *Times*[3] as "disquieting," have followed up 150 consecutive patients admitted to a medical ward in the Radcliffe Infirmary; the follow-up took place 12–18 months after discharge They estimate that 680 bed-days were wasted by delay in the discharge of 25 patients—a delay due to the lack of suitable institutions for patients who merely needed general nursing. If these beds had not been blocked in this way 65 additional acute cases could have been admitted Although the family doctor was always given full details, coordination in after-treatment was often far from satisfactory, and the same was true for patients transferred to other hospitals or institutions for convalescence: thus in one case quoted a boy recovering from rheumatic fever spent three months in a room almost entirely occupied by old and infirm patients. Investigation showed that 70% of the patients had not had the supervision requisite for satisfactory convalescence and rehabilitation.

Now, when the organisation of our medical services is in the melting-pot, seems to be the time to tackle this problem in its threefold form. In the first place there is the educational aspect. If our students are to serve their future patients efficiently they must be trained to see the social aspects of medicine; and this can best be done on some such lines as those followed at Syracuse. It is no novel idea in this country: in Edinburgh, for many years, a feature of the medical curriculum has been "the dispensary," where students attend under the supervision of junior members of the hospital staff and are required to see patients in their homes. Secondly, there is the economic aspect so far as our hospitals are concerned. It is obviously wasteful for patients to be detained in a hospital staffed with highly trained doctors and nurses, and equipped with all the paraphernalia of modern diagnosis and treatment, once they have reached the stage when they want only general nursing and medical supervision: Such supervision could be provided much more cheaply, and equally well, in institutions in the country, where, with domestic assistance, a few medical officers and trained nurses could look after many patients. Finally, and closely related to the economic aspect, is the primary problem—how we are to ensure that as many patients as possible are not only relieved from their maladies but restored to their rightful places in society and able to earn their living? The old idea of the hospital as an isolated unit must clearly be discarded, and our hospitals must become part of an integrated system which continues to serve the patient until medicine can do no more for him. It is here that the "peripheral" hospitals must play their part, by taking over the patients who have had specialist treatment in the "central" hospital but are not yet fit to return home. The peripheral hospital must of course be in close touch with—and sometimes will be staffed by—local practitioners, so that when the patient is finally discharged, his home doctor will know all about him.

In the organisation of these smaller hospitals much could be learned from another report issued by the Commonwealth Fund[4] on the experience gained in running 13 small "community hospitals" in American rural areas staffed by general practitioners. Though American conditions and practices differ widely from ours, they have the same need for coördination of all the social services and their integration with hospital and general practice.

Annotations

THE TWO-STAGE OPERATION IN ITALY

THE Allied armies in Italy have now had the great victory they deserve. The medical services, there as on other fronts, have no small share in the credit, and we are glad this week to be able to publish a group of papers showing what success has lately attended the treatment of the wounded. Brigadier Edwards and Brigadier [illegible] in Italy, introduce a [illegible] results achieved by [illegible] wounds as an operation [illegible] of the wound by the [illegible] early closure by those at the base. The conception is not new: it dates from the last war. But modern methods of chemotherapy and the particular circumstances of the campaign have facilitated its general application in Italy, with a success which is apparent from the large number of cases now analysed. The papers appearing this week and next week are by many different surgeons, emphasising different aspects of the work; and it should be recognised that some of the authors and their colleagues, though young in years, have acquired exceptional experience in the long advance from Alamein towards the Alps. To permit of early publication these papers have been considerably shortened, and we must accept the responsibility for any damage thus done to them. But enough remains to form an instructive and cheerful chapter in the surgical history of the war.

PENICILLIN BY MOUTH

IN the early years of penicillin therapy the most exciting advances were those that expanded its range. It has now become unlikely that any disease of numerical importance will be added to the list of those amenable; but in other directions expansion of knowledge goes on, and there is still much to find out. We need to know more, for example, about the mode of action of penicillin; we must find better methods of tackling micro-organisms which, though susceptible, are hard to reach; and we can no doubt improve our ways of giving the remedy. Now that penicillin is beginning to be plentiful, "wasteful" methods such as administration by mouth may justifiably be the subject of research, though not necessarily of general use. Anyone who has endured the rigours of intramuscular injections every 3 or 4 hours for several days, or the discomforts of a continuous infusion, will be in favour of investigating alternative methods.

On Feb. 17 we reviewed the use of penicillin by mouth and by rectum, apropos the work of Little and Lumb, who reported promising experimental results from oral administration of penicillin mixed with a raw egg, preceded by bicarbonate. It seems probable that, both mechanically and chemically, such a vehicle will help to protect penicillin from destruction by the hydrochloric acid in the stomach, but the claim that after oral administration the concentration of penicillin in the serum and the amount excreted in the urine were similar to those found after intramuscular injection of the same dose ran counter to previous research[1] and to expectation based on knowledge of the extra variables introduced when a drug is given by mouth instead of by injection. Heatley's paper published today shows the results of careful repetition of Little and Lumb's principal experiments on absorption. While he confirms that oral administration in egg after milk and bicarbonate is followed by better absorption than oral administration in water, there is in other respects a divergence. The proportion of the dose excreted in the urine after administration in egg did not in any of his four subjects approach the proportion excreted after intramuscular injection. More important, the maximum concentration in the serum was only about a tenth of that reached after intramuscular injection; and though it was just high enough to inhibit a sensitive organism, the inhibitory level was, in 3 of the 4 subjects, not maintained so long as when the penicillin was given by intramuscular injection—which is somewhat surprising. While it is not yet certain whether there are advantages in the high "peak" levels maintained for the first hour after intramuscular injection, it is clear that the duration of the demonstrable blood level after 15,000 units in egg was not satisfactory in Heatley's subjects. In other words, oral administration in this vehicle is a "wasteful" method. Heatley's figures also illustrate once more how great the differences may be in different individuals, and one may surmise that there are also differences in the same individual at different times.

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[2] Brown, M., Carling, C. Brit. med. J. 1945, i, 475.

[3] *Times*, April 14, 1945.

[4] Southmayd, H. J. Small Community Hospitals, London, 1944, pp. 182, 11s 6d

Almost simultaneously comes a paper from the United States by Gyorgy et al.[2] Omitting laboratory studies in the first place, they went straight to the clinic and obtained a cure in 16 men with gonorrhœa by giving 15,000 or 20,000 units of penicillin by mouth, with sodium citrate, 3-hourly for two or three days. One case with a complication relapsed but was cured by a second course. Even if confirmed on a larger scale, however, this success in gonococcal urethritis would not mean that the same method would succeed elsewhere; for gonorrhœa is more consistently and rapidly responsive to penicillin than any other infection. For their laboratory studies of blood levels after oral administration, the same authors used the relatively much larger dose of 40,000 units in children aged from 3 weeks to 12 years. With these large doses the duration of inhibition in the blood (though not the height reached in the first hour) was comparable with that after a standard intramuscular injection, if the dose was given in buffer.

Other preliminary communications have also appeared in the last few months. Recovery of penicillin in the urine, but without blood-level estimations, has been studied by Charney et al[3] and Free et al[4] after 20,000 units and 100,000 units respectively, given with and without various buffers. Libby[5] and McDermott and his collaborators[6] describe experiments with more adventurous vehicles. Arguing that digestion of fat virtually begins only in the intestine, Libby passed acid penicillin directly from an organic solvent into oils and fats; but these solutions were unstable. Suspensions or dispersions of the sodium or calcium salts in oils were more satisfactory, and a graph shows that 90,000 units by mouth in cotton-seed oil produced an inhibitory level for about 6 hours in one experiment, though it should be noted that the blood levels shown are unusually high relative to the urine levels at the corresponding time (compare, for instance, the figures in Heatley's subjects). The period of a demonstrable blood level could be prolonged by additional "boosting" doses of 20,000 units, and absorption appeared to be better on an empty stomach than after food. Following up this work McDermott tried the vehicle used by Romansky and Rittman[7] to slow absorption after intramuscular injection—namely, peanut oil with beeswax. With the heroic dose of 315,000 units there was no great difference in the peak level reached in the blood from the beeswax vehicle, corn oil, buffer, and water; the duration of the inhibitory level was not shown on their graph.

As in other fields of exploration of penicillin, there is scope here for originality and ingenuity, applied in careful laboratory study; but the investigation is still young. On the evidence up to date it seems likely that even when reliable methods have been perfected the general use of penicillin by mouth will not be justifiable while supplies remain far short of the potential demand.

THE ADRENALINE FAMILY

Ephedrine will soon be celebrating its diamond jubilee,[8] and adrenaline reaches its golden one this year.[9] Since these natural sympathomimetic amines were isolated a long list of allied synthetic compounds, each resembling its parents in action but having its own peculiarities, have been developed. Stolz and Dakin set the ball rolling in 1905 by synthesising adrenaline, but Barger and Dale[10] made it spin in 1910 by correlating chemical composition with pharmacological action. And, as a symposium organised by the American Chemical Society[11] makes clear, we have hardly begun to explore the possibilities in this field. Only a small proportion of even the known sympathomimetic amines have yet established themselves in daily use.

As vasoconstrictors this group of drugs are widely but often unwisely employed in upper respiratory infections. For this purpose those with the least central action, such as neosynephrine or paredrine, are probably the most suitable, though the volatility of amphetamine makes it a popular choice. In allergic conditions, especially asthma, they are our great stand-by, while for the alleviation of "shock," particularly the varieties associated with anæsthesia, the newer preparations have a promising future. The central effect of the drugs is being increasingly utilised; amphetamine has relieved nearly 100% of cases of narcolepsy, while in parkinsonism and epilepsy it is a valuable adjunct to other forms of treatment. A large series of compounds derived structurally from β-phenethylamine (the amine from which Barger and Dale began their work) have been produced which all raise the blood-pressure, but in which this effect cannot always be ascribed to the same constituent of the molecule. This suggests that elevation of blood-pressure may be caused by several different mechanisms; if so, further research along these lines may throw light on the control of blood-pressure and the problem of hypertension. This problem may also be clarified through work on amidazole derivatives, some of which produce vasoconstriction while others produce vasodilatation. Other subjects for investigation which may prove fruitful include specificity of action—for example, a derivative which would increase the expulsive power of the myocardium without at the same time raising the blood-pressure through vasoconstriction would be valuable in the treatment of the failing heart. Similarly, a specific action on the bronchi without the pressor effect of adrenaline would improve the outlook in the treatment of asthma, while the central stimulant effect of amphetamine on the central nervous system would be more valuable if it could be dissociated from the troublesome side-effects.

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1. Rammelkamp, C. H., Keefer, C. S. *J. clin. Invest.* 1943, **22**, 425; Rammelkamp, C. H., Helm, J. D. *Proc. Soc. exp. Biol., NY*, 1943, **54**, 324.
2. Gyorgy, P., Vandegrift, H. N., Elias, W., Colio, L. G., Barry, F. M., Pilcher, J. D. *J. Amer. med. Ass.* 1945, **127**, 639.
3. Charney, J., Alburn, H. E., Bernhart, F. W. *Science*, 1945, **101**, 251.
4. Free, A. H., Leonards, J. R., McCullagh, D. R., Biro, B. E. *Ibid*, 1944, **100**, 431.
5. Libby, R. L. *Ibid*, p. 178.
6. McDermott, W., Bunn, P. A., Benoit, M., Du Bois, R., Haynes, W. p. 228.
7. Romansky, M. J., Rittman, G. E. *Bull. US Army med. Dept.* October, 1944, p. 43.
8. Nazai, N. *Pharm. Z.* 1887, **32**, 700.
9. Oliver, G., Schafer, E. A. *J. Physiol.* 1895, **18**, 230.
10. Barger, G., Dale, H. *Ibid*, 1909, **41**, 19.
11. *Indust. & Eng. Chem.* February, 1945, p. 116.

Here then is a sphere of research in which combined operations by pharmacologists and chemists promise a handsome return, and not only in the realm of therapeutics.

EXPERIMENTAL SEASICKNESS

CHANGES of position of the head during rotation in a Bárány chair may cause severe nausea, while rotation alone has little effect. Spiegel and his co-workers[1] point out the importance of repeated accelerations and decelerations in the causation of the various kinds of motion sickness. To study these factors they place the subject in a chair which must make many persons sick even to contemplate. While it rotates in the horizontal plane, a clamp in which his head is fixed causes the subject rhythmically either to nod backwards and forwards or to rock his head from shoulder to shoulder. Surprisingly, only about 53% of victims were "seasick" within four minutes with the first combination of movements; but the second combination accounted for 67%, and 75% succumbed when submitted to the treatments in succession. The susceptibility of persons as assessed from their history agreed with the experimental findings, and confirmed the order of severity in which the tests were placed. The third test (rotation accompanied by first one and then the other head movement) is regarded as severe, and the conclusion is that anything which would prevent a positive reaction to it would be a certain cure for seasickness. It seems to be taken for granted that the addition of visual stimuli would make matters worse: at all events, subjects exposed to them were all given a sedative, so experiments made with the help of lights can only be compared with each other and not with the original motion studies. Subjects fixating a light rigidly attached to the head-rocker were less ill than those encircled during their ordeal by a ring of stationary lights. This was to be expected, for the eye is held by a vivid object, and its attempt to fixate a stationary light, in spite of the complicated motions we have described, might well lead to distress. The authors do not refer to the fact that real seasickness tends to feel worse in a closed space than on deck, though the experiments with the lights might lead one to suppose otherwise. The only "stationary object" viewed from the deck is, however, the horizon (if visible), which unlike the stationary lights can be fixated uninterruptedly. Many people feel less sick the more they can make themselves conscious that the horizon is stationary and the ship rocking beneath them; and more sick when they are less conscious of the movement of the ship but feel that the horizon is misbehaving. This may have some connexion with the observation of Spiegel and his colleagues that illusions of rhythmic movements of the trunk and limbs were often more definite in those subjects who were least sick after the ordeal of the chair, as though a definite impression of spatial orientation from the muscles, tendons, and joints, even if illusory, were a corrective to sickness. The investigators, however, regard illusions of orientation and sickness as independent, and discuss many other aspects of the various reactions.

MEDICAL HISTORY IN AUSTRALIA

THE Royal Australasian College of Surgeons at Melbourne bought last year the fine historical medical library collected by Dr. Leslie Cowlishaw, and a preliminary catalogue of the books has been made by Miss N. C. Andrew, librarian of the College. Leslie Cowlishaw, who died in December, 1943, near Sydney, where he had practised since the last war, was a pioneer medical historian in Australia. He was yet another example of a busy general practitioner finding time for serious contributions to scholarship and education. For Cowlishaw was not content to use the advantages of inherited wealth and a wide knowledge of Europe for his private enjoyment. He made himself, after his return from war service, an apostle of the cause of medical history as an integral part in the mental equipment of the complete doctor. It was Cowlishaw who twenty years ago founded the section of history and literature in the NSW branch of the BMA, and a similar section at the Australian Medical Congress of 1929; and from 1931 he gave, unpaid, an annual course of lectures on medical history for final-year students at Sydney University, which he illustrated from the riches of his own library. Cowlishaw's interests ranged over the whole field of medical history but he had made a special study of the development of medicine in Australia. He published a number of essays and was in demand as a lecturer at various medical institutions. In an address at the RACS he pointed out how far Australia lagged behind Canada in the provision of good medical reference libraries. The RACS has already done much through its active library policy to improve the position, and now by adding Cowlishaw's library to its resources has benefited itself and the profession in Australasia and established the best memorial to Cowlishaw's work and faith.

The catalogue shows that it was no mere museum of old books that Cowlishaw amassed. His library is peculiarly rich in books of reference; all the outstanding histories of medicine from Baas to Castiglioni are here, as well as many less well known in English, French, German, and Italian, with numerous special histories and bibliographies, the essential keys to the older literature. The basic texts which every student of past medicine must examine are here in their early editions. There are long series of the works of Hippocrates, Celsus, and Galen; Gui de Chauliac's editions include that of Venice 1490: many of the great books of the rebirth of science can be read in this library—the second Fabrica of Vesalius and the rare German edition of 1551; Realdus Columbus, Fracastoro, Fabricius, Paré. The seventeenth century, especially the English school, is not neglected; both the English and the Dutch issues of Harvey on Generation are here and Des Cartes De Homine, one of the earliest of physiologies. These are only a few of the most worth-while texts which will now be publicly available, perhaps for the first time, to the profession in Australasia. Though Cowlishaw evidently did not cultivate the eighteenth century so assiduously, nor attempt to collect systematically the masterpieces of nineteenth-century medical discovery, the student of these more recent times will also find much in his field.

BLOOD-PLASMA DROPPED BY AIR

IN the United States a method of packing bottles of blood-plasma has been devised which allows them to be dropped from aircraft without the use of parachutes, which might be spotted by the enemy or drift into enemy hands. The boxes of bottles, weighing 100 lb., can be dropped without harm from 10,000 feet. Each bottle is packed in a material resembling 'Excelsior,' and the boxes (made of wood) are tied together with a special kind of wire, of strong alloy steel. This wire absorbs most of the bursting effect of the fall: when the box hits the ground it bounces about 30 feet into the air, and then lands intact.

MR. H. S. SOUTTAR, consulting surgeon to the London Hospital and formerly chairman of the council of the British Medical Association, has been elected president of the association in succession to the late Lord Dawson.

THE next session of the General Medical Council will open on Tuesday, May 29, at 2 P.M., when Sir HERBERT EASON, the president, will deliver an address.

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[1] Spiegel, E. A., Oppenheimer, M. J., Henny, G. C., Wycis, H. T. War Med. 1944, 6, 283.

Reconstruction

THE HOSPITALS OF LONDON

AND THE SURROUNDING AREA

IN October, 1941, the then Minister of Health announced that a hospital survey of England and Wales was to be made. Its objects were to find out what facilities existed, to assess their adequacy, and to suggest how they could be coördinated and expanded to provide an efficient and complete service.

England and Wales was divided into ten areas. In seven of the areas the Nuffield Provincial Hospitals Trust appointed the surveying officers; but in three (the London district, North-west England and North Wales, and South Wales) appointments were made by the Minister. The first of the three reports made directly on behalf of the Minister has now been published.[1] It emphasises that the views expressed are those of the surveying officers only, and not of the Ministry. Nevertheless it must be assumed that these officers have at least had in mind official policy on such matters as optimum size of hospital, the relation of general to special hospitals, and the other broad principles which must form the basis of any hospital service. The report is then of double interest—both as a pointer for the future in the planning of a regional hospital service for London, and as an indication of official views on hospital policy, which did not emerge in the white-paper on a National Health Service.

POPULATION AND BEDS

The area covered is extensive. Essex, Hertfordshire, Bedfordshire, small parts of Buckinghamshire and Berkshire, Surrey, Sussex, Kent, Middlesex, and the county of London make up one area, which can be treated as a whole, since communication radiates centrally from London. Hampshire and Dorset, with the Isle of Wight, constitute a subsidiary area. The Chilterns provide a rough boundary to the north-west of the London group.

The population of the whole area in 1938 was slightly over 14 million. Of this about 1½ million were located in the Hants, Dorset, Isle of Wight area. Apart from the Greater London conurbation, and the smaller urban concentrations on the coast, the only inland towns in the area with more than 50,000 population are Colchester, Luton, Slough, and Watford. There are some 380 governing bodies of voluntary hospitals, 25 major hospital-owning local authorities, 20 minor authorities with maternity homes; and 130 isolation and smallpox hospitals also provided by minor authorities singly or in combination. As a result, admission to municipal hospitals is often hampered by administrative boundaries, while the independence of the voluntary hospitals has caused dispersal and competition instead of concentration into efficient units.

The report does not deal with mental hospitals, psychiatric services, or dental hospitals, except in so far as they are parts of general hospitals.

In 1938 the voluntary hospitals admitted some 473,000 new inpatients, while the municipal hospitals admitted 477,000. On the other hand, the voluntary hospitals dealt with eight times as many new outpatients as the municipal hospitals. There are more than twice as many voluntary hospitals with under a hundred beds as there are with over a hundred beds. Indeed, of 380 voluntary hospitals, more than 160 have less than fifty beds.

The report is critical of the large amount of surgery done at the small "general practitioner" hospitals. This in itself is a reflection of the poor distribution of consultants in the area. Again, the care of the chronic sick is far from satisfactory.

The following table shows three theoretical estimates (A, B, and C) of the number of beds [illegible] types of patients, together with the actual figure for the county of London:

Type of case	Number of beds per 1000 population			
	A	B	C	Actual figure for county of London
General acute	4·5	5·8	6·4	6·3
Maternity	0·4	1·28	1·0	0·41
Chronic sick	1·5	1·6	1·0	1·2
Pulmonary tuberculosis	0·8	0·7	0·8	0·71
Infectious diseases ..	0·8	0·7	0·7	1·6

Taking the area as a whole, there is a [illegible] of beds, except for the chronic sick and [illegible]. But in these two instances the accommodation provided is generally obsolete.

As a result of the war and the setting up of the Emergency Hospital Scheme, the nett gain in beds over the area as a whole is 10,893. The d[illegible] has been greatly improved; [illegible] for orthopædics, neurosurgery, a [illegible] up; and a beginning has been made in improving the pathological services throughout the area.

RECOMMENDATIONS

The report points out that hospital services are far more a matter of staff than of buildings. A modern and fully equipped building is of course highly desirable; but it would be nearer the truth to say that a good hospital consists primarily of an expert medical and nursing staff.

The surveyors condemn the [illegible] hospital as a surgical specialist c[illegible] hospital should be attached to, and work with a district hospital, on which the specialists should be based. The function of the local or general-practitioner hospital should be to provide for the medical cases not requiring elaborate investigation but not capable of being nursed at home, for minor operations (excluding the removal of tonsils and adenoids), for normal maternity cases, for the few urgent emergencies and accident cases which cannot be taken to the district hospital, and for convalescents. Specialists should visit local hospitals regularly and should hold outpatient clinics there. In urban areas, the local hospital is unnecessary.

It is recommended that the main or district hospital should not exceed 1000 beds or fall below 400, the optimum being about 800. Such hospitals would serve an area with a population of 100,000–200,000. A 940-bed district hospital might have 100 beds for infectious diseases; 150 for chronic sick; 100 for children; 50 for maternity cases; 40 for pulmonary tuberculosis; 30 each for gynæcology, and ear, nose, and throat; and 220 each for general medical and general surgical. Skin, genito-urinary, and eye inpatients units should be concentrated at selected district hospitals, so that skilled nursing could be provided.

A third type of hospital is proposed, to be known as the special centre. Such centres would serve areas much wider than those served by district hospitals. Some of these might be independent special hospitals—for example, the fever hospital, the chest hospital, the orthopædic hospital, and the reablement centre. Others might form part of individual district hospitals—for example, the radiotherapy unit, the neurosurgery unit, and the plastic surgery unit. The specialist staff of such centres should hold outpatient clinics at adjacent district hospitals, and should be available for consultation to general practitioners.

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[1] Hospital Survey: the Hospital Services of London and the Surrounding Area. By A. M. H. Gray, CBE, MD, FRCP, FRCS, and Andrew Topping, MD, MRCP, DPH. Ministry of Health, 1945. HM. Stationery Office. Pp. 229. 10s.

For such a hospital service to be made available, pooling of specialists is essential. Payment for part-time work is strongly recommended, on a salary rather than a sessional basis. It is felt that sessional work tends to cause specialists to be accused of rendering unnecessary service, while hospitals are tempted to economise by not calling specialists in.

On the question of town versus country hospitals, the report favours the town hospital as a basis, while pointing out that there is no reason why proper planning should not make an urban hospital as pleasant a place as a country hospital from the patient's point of view.

It is inside this broad framework that the detailed recommendations for each area are made. The conception of the key hospitals goes by the board; and the surveyors have leaned nearer to the proposals of the Specialist Medical Association than to those of Medical Planning Research in this respect. Nevertheless, they adopt the Medical Planning Research proposals for making use of the cottage hospitals in rural areas as local centres for the treatment of minor illness and for out-patient clinics.

Their constructive report will interest everyone concerned with the future of the national hospital service, whether in London or elsewhere.

Special Articles

PSYCHOSOMATIC MEDICINE AND THE DECLINING BIRTH-RATE

JAMES L. HALLIDAY, M D GLASG.

THE purpose of this paper is to suggest the value of applying a psychological approach to the problem of the declining birth-rate.

CLINICAL OBSERVATIONS

Behavioural sterility as an expression of neurotic nxiety.—During the thirties (1931–39) I acted as a edical referee of insured persons in Scotland. The ollowing notes are based on my experiences and npressions at that time. The group of patients to which hey refer cannot, however, be regarded as a random ample of the general population, the majority having een on the sick list for several months and the pro-ortion of psychoneurotic illness among them being igh (Halliday 1935).

In the course of questioning patients I came to realise he frequency of the practice of birth control—usually y coitus interruptus. Knowledge of the safe period as not common. I also formed the opinion that, at east during this period of historical time, evasion of arenthood was more often the wish of males than of emales—an observation also made by Charles (1936). he evasion, whether in husband or wife, was almost lways associated with an underlying neurotic anxiety. he reasons given for the behaviour were often of the ature of rationalisations: the inner emotional state f the patient provided his intellect with apparently ogical reasons for not begetting children. (Compare he person who, under hypnosis, is ordered to perform

n males the commonest reasons given were that the ife was not strong enough" or he "did not wish the

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them to have a better
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tatements provide examples of identification of the nale either with the woman or with the children—in ther words, the husband was ceasing to be a virile ather figure. In women the commonest reasons given were that "my husband does not want any more children" or "the doctor says I am not strong enough." Many of the patients (especially those with psychosomatic organic diseases) showed decided obsessional trends in the sense that they tended to arrange their lives in an excessively ordered way—this being an attempt to compensate for deep-seated feelings of anxiety, isolation, insecurity, or resentment. In these individuals behavioural sterility could often be related to their obsessional characteristics in that persons with this
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F *neurotic anxiety.*
—D ins of generation are known to occur in certain women in association with deep-seated anxiety. Common examples are modifications in the menstrual cycle and inhibition of the vulvar secretion normally evoked by sexual excitation. Psychophysiological dysfunction may even affect the ability of certain women to conceive in spite of active insemination and in the absence of organic or mechanical faults. This possibility is suggested by psychiatric consideration of individual case-histories and receives some statistical support from serial investigation of sterile women from a psychiatric angle (Wittkower and Wilson 1940). In males, the effect (if any) of the emotions in modifying the vitality of spermatozoa is quite unknown.

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only one among the many expressions of a decline in the psychological health of the community, associated with an increase in communal anxiety.

EPIDEMIOLOGICAL CONSIDERATIONS

Birth-rate as an index of psychological health.—Until recently it was customary to regard public health in terms of physical health alone. Thus before the war it

a yardstick of the public
eath-rates, infant mortality
tuberculosis and infectious
disease rates, the height and weight of school-children, &c. But the public health is Janus-faced, and at a time when its physical side was brightening its psychological side was seen to be darkening by those who cared to look at it. The decline in psychological health was revealed by a different series of indexes whose trend took a direction not towards improvement but towards deterioration. These were related to psychological

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INCIDENCE OF PSYCHOSOMATIC ORGANIC DISEASE

Analysis of the incidence of these affections in Britain showed that in the period 1900–39 there was a progressive increase in psychoneurotic and psychosomatic illness. The data are fully presented in the original paper (Halliday 1945), some of whose conclusions relevant to the birth-rate may be mentioned here.

Age.—The rate of rise in the incidence of these disorders was most rapid in the younger age-groups. (There is probably an analogy here with the decline in the birth-rate which became more intense in the younger generations.)

Sex.—The upward trend was steeper in males than in females, except in the cases of diabetes and suicide. This may be stated in another way: diseases which were commoner in females in the 19th century (peptic ulcer, exophthalmic goitre, and perhaps hypertension) became during the 20th century increasingly commoner in males. In the case of peptic ulcer, there was an actual reversal in sex-incidence. Correspondingly, conditions which were commoner in males during the 19th century (diabetes and suicide) became during the 20th century increasingly common in females. In the case of diabetes, there was reversal in sex-incidence. The interpretation of this phenomenon is complicated, but it would appear that with the altering social environment during the period the "personality" of males was becoming relatively more feminine and that of females relatively more masculine. This trend towards neutralisation of sexual distinction in psychological characteristics probably played a part in determining the decline in the birth-rate.

Social groups.—Different social groups showed considerable differences in incidence. For example, in urban areas the rate of neurosis and psychosomatic diseases was definitely greater than in rural areas. This may be compared with the decline in the birth-rate which was also greatest in urban areas (Charles 1936). Unfortunately it is not possible to state whether, as happened in the case of the decline in the birth-rate, the increase in the psychosomatic affections began in the higher-income groups, because figures dealing with their incidence are not available for the beginning of the period studied.

Psychobiological interpretation of the declining birth-rate.—From a biological standpoint, the declining birth-rate is an expression of group reaction to the total situation, especially in its psychological aspects. It is therefore inappropriate, even misleading, to regard the phenomenon (as certain writers have done) as a manifestation of a "voluntary decision on the part of individuals." In the mass and in essence, a declining birth-rate is no more voluntary than an increase in the incidence of duodenal ulcer or exophthalmic goitre. In a final analysis it would be seen to represent a predictable biological happening in response to the totality of circumstance.

SOCIAL DISINTEGRATION AND THE BIRTH-RATE

To distinguish between the physical and psychological aspects of public health is pragmatically justifiable and epidemiologically useful. When we adopt this way of looking at things the decline in the birth-rate is seen to be only one of the many manifestations of a morbid communal process which is sometimes identified as social disintegration—a term of wider connotation than that of psychological health (Halliday 1943a). Indexes of social disintegration comprise not only the medical indexes of psychological health already mentioned; but also indexes in terms of other interests—e.g., industrial, economic, religious, and cultural. Writers concerning themselves particularly with the non-medical indexes have also described this social process by various other labels, such as "Western civilisation," "the socio-economic capitalist set-up," or "the break-up of a culture." Social disintegration, however, is probably the most useful general term, because it indicates that the problem—which medically is one of psychology—has other and wider aspects concerned with the structure of society and having a bearing on group survival, whether of family, sect, nation, or race.

World distribution of social disintegration.—Before the present war medical indexes showed that social disintegration affected not only Britain, but also the countries of Western Europe, North America, and the British Dominions. In each of these there was a falling birth-rate, a rising incidence of psychoneurotic and psychosomatic disease, and a tendency towards a rising suicide-rate. These happenings were in great contrast to the findings in primitive races (i.e., non-industrialised native communities) in whom such diseases as peptic ulcer, hypertension, exophthalmic goitre, and diabetes are either unknown or exceedingly rare (Donnison 1937). Figures of the incidence of psychosomatic disease in Soviet Russia, in which the birth-rate was rising during the twenties and thirties, do not seem to be obtainable.

Origin of the upward trend of social [illegible] Britain.—Study of social history sugg[illegible] about the year 1870 the general communal set-up (religious, economic, social, moral, and cultural) was beginning to disintegrate. "Your creeds are dead, your rites are dead, your social order too," as Matthew Arnold wrote in the '60's. With the break-up of the old order and the increasing uncertainties of the period we may suppose that the generation born in 1870 who became parents about 1900 would be mildly anxious and have fewer offspring than their fathers. The second generation born in 1900 who grew up through war, strikes, financial crises, and mass unemployment would respond by still further anxiety, so that when they married about 1930, there would be still fewer children for the third generation and these would be hyper-anxious. This supposition may be related to the following actual numerical facts:

> Taking the fertility-rate (England and Wales) of 1870 as 100%, the drop in fertility by 1900 (the mildly anxious generation) was 25%, and the drop by 1930 (the second and definitely anxious generations) was 59% (Titmuss 1942).

These ideas are illustrated in the following table in which the letters P and C refer to parent and child and the plus sign to the degree of morbid anxiety.

	Degree of anxiety		*Fertility-rate* (%)
1870	P	C	100
1900	P +	C + +	− 25
1930	P + +	C + + +	− 59
1960	P?	C?	?

Social disintegration and individual isolation.—The presence of social disintegration in a community is revealed clinically by its symptoms: that is, by the indexes of the incidence of certain diseases and happenings. The pathology of the morbid process is highly complex but it can be described in a general way as an expression of the rapid loosening of pre-established group-bonds, as the result of which the individual becomes increasingly isolated and therefore increasingly insecure and inwardly anxious. From this viewpoint, its "therapy" would depend on the establishment of new group bonds which would restore to the individual the sense of *belonging.* This indeed happened to some extent on the outbreak of war, but the resulting improvement of the indexes of psychological health has been tempered by many special stresses such as bombing, overcrowding, long working and travelling hours, changes to unsuitable occupation, blackout, and boredom (Halliday 1943a).

It is interesting to note how isolation in an obvious and crude form progressively affected the new life born into the dissolving society of this century. At its very beginnings the infant was, to an increasing extent isolated from warm bodily contact with the mother as a result of the decline in breast-feeding and the disappearance of the "shawley-wife." Oral play with the nipple was frowned upon, and its substitute, the dummy teat, was consigned to the furnace by the hygienist. Such curbing of normal infantile tendencies probably modified the unfolding personality of the individual by inducing permanent tensional states of the vegetative and neuromuscular systems. This is suggested, not only by psycho-analytical research, but also by animal experiment. For example, Levy (1928) showed that puppies allowed to receive adequate nourishment but prevented from continuing sucking grew up into dogs that showed distinct character differences especially restlessness, compared to controls from the same litter, who had been allowed to suckle normally.

On reaching the toddler stage, the child encountered further isolation. The progressive decli[illegible] red that he had fewer playmates a[illegible] of housing schemes and bungalows: [illegible] till further from coeval companions. He was, therefore, thrown more against the parents who began to feel that they were never left alone and their continual reactive prohibitions and admonitions rendered him insecure, retiring, or subdued, and unable to liberate his aggressive emotional life in the active social expressions proper to its age. Perhaps, too, during this period of historical time the pressures of domestic environment tended to favour the development in the young child of obsessional trends as defences against a universe that was sensed to be dangerous and upsetting and against which he felt so powerless. In other words, the particular type of social situation that prevailed increasingly produced individuals with a rigid character structure who "kept themselves to themselves."

On leaving school the child was faced by a world of increasing competition not only in employment but also in social display. The extending propaganda of advertisements and the cinema provided luxury and a good time as ideals. If the individual married it was in response not only to fear but also to fashion that he reacted by inhibited sexual functioning. If a baby were born, the mother (who had probably been engaged in some commercial or industrial employment because by this time women were becoming "free" and "emancipated") resented that she was saddled with a burden not borne by her husband and he in turn, feeling that his wife was an equal and a similar, experienced pity and guilt. Thus parents in their isolation, resentment, and puzzlement became over-anxious and this anxiety was in turn communicated to the child.

The increase in incidence of neurotic and psychosomatic illness during the period accelerated between the two world wars and the general lack of recognition of its ætiological significance (even by the medical profession) provided many potential parents with an alibi—they had no children because of health reasons. In spite, therefore, of improvement of public health services, statistics showed that the nation was becoming more and more unfit, not only for parenthood, but also for work. This was shown by analysis of the statistics of the chronically sick Scottish insured population between 1930 and 1935 (a time of high unemployment and of *not* belonging), when the amount of chronic sickness increased by one-third, the excess being compounded almost entirely of disease labels indicative of neurotic and psychosomatic illness and the greatest rate of increase being in the younger age-groups (Halliday 1938).

INFERENCES AND GUIDANCE FOR ACTION

Approach to the problem of the declining birth-rate from the standpoint of clinical medicine and epidemiology suggests that it is but one of the many symptoms of a social disease whose core is neurotic anxiety. Any attempt at "birth-rate therapy" must take account of this basic consideration. Measures suggested for increasing the birth-rate must therefore aim at diminishing causes of social anxiety. Moreover, as anxiety is contagious, such procedures must be concerned not only with parents but more especially with parents to be—that is, with children.

Many of the causes of social anxiety lie outside the field of medicine proper, but one point may be mentioned here—namely, that anxiety cannot be bribed away by monetary payments. Thus a system of children's allowances cannot in itself cure social disintegration or remedy the birth-rate, and it is in accordance with reasoned expectation that the effect of therapeutic experiments of this nature should be slight and only temporary—as indeed has been exemplified in those countries which have tried it at a time of declining psychological health.

Therapeutic standards.—Measures suggested for reversing the trend in the birth-rate—for the treatment of social disintegration—require to be tested against two standards:

> *Primum non nocere.*—Is this measure likely to increase neurotic anxiety? If so, it must be rejected. If not, does it fulfil the second test?
>
> *Secundum liberare.*—Does this measure liberate socially integrating forces?

Illustrative therapeutic measures.—Two illustrations may be given of proposals conforming to therapeutic standards:

> That every mother receive for each child in its early formative years (up to the age of 3 or 5) everything that is required—food, clothes, perambulators, go-carts, baby chairs, utensils—everything—without charge and irrespective of social class.

The positive value of this step is that it would relieve the anxiety of many parents and give them a sense of belonging to the community. It would also have its effect on the infant in that the child would sense it was welcomed. The negative value of the measure is that it would not increase communal neurosis by identifying babies with money or social class. Furthermore, the procedure is evolutionary rather than revolutionary in that it represents a natural extension of the rationing system introduced by the war and would therefore tend to be accepted naturally by all mothers. The linkage of parenthood with child-welfare centres would also be made more complete and satisfactory.

> That day-nursery provision for toddlers and of nursery schools for children up to the age of 7 be extended. This measure would need to be accompanied by intensive and appropriate propaganda.

If these nursery facilities were available *and used,* the present generation of neurotic parents would be relieved of further tensional loads. Moreover, children would tend to develop an immunity to domestic anxiety through receiving it in smaller and spaced-out doses. Through early initiation into the company of other children, the child would tend to grow up with the inner sense of securit[illegible] to the group. In short, the [illegible] more at one with life than [illegible] their parent(s) through fear, [illegible]. It may be objected that such proposals "take away the responsibility of parenthood." From the biological standpoint, however, the incidence of births in a group is not a matter of will or morals but is a response to a given social environment.

Further examples of therapeutic measures.—Other measures likely to decrease social anxiety may be mentioned briefly. One is the need to supply sufficient houses suitably planned for family life; this is generally accepted. Another is the need to place such houses so that they form a natural community round a community centre at which, as the Peckham experiment has suggested, a biological health service—as contrasted with a salvage health service—might be located (Pearse and Crocker 1943). Other matters include a reconsideration of the present examination system in schools with its emphasis on aggressive competition as contrasted with a system of scientific selection; vocational guidance; compulsory labour camps or their equivalent; and "social security" in its psychobiological sense—i.e., security against preventable neurotic anxiety. That involves, however, much more than financial provision and much more than can suitably be discussed in a medical contribution whose aim is not to propound a thesis but to illustrate a viewpoint.

SUMMARY

The declining birth-rate in Britain during the last 70 years was very largely an expression, or symptom, of a decline in the public health viewed psychologically (i.e., in "psychological health") and this in turn was [illegible] communal [illegible] based on [illegible] relevance of psychosocial factors can help to provide a generation of young persons less inhibited by neurotic anxiety and, as a consequence, socially more healthy, psychosomatically less incapacitated, and biologically more fertile.

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BELSEN CONCENTRATION CAMP

THE MEDICAL SERVICES TAKE OVER

On April 12 two German emissaries of the Wehrmacht under a white flag contacted the advancing British forces and informed them that there was a concentration camp at Belsen containing some 60,000 prisoners stated to be mainly political. There were said to be 1500 cases of typhus, 900 of typhoid, and many others, infectious and otherwise.

The Belsen area was made neutral, and the Germans undertook to erect notices of typhus. SS guards were to be removed by April 13, leaving some German and Hungarian personnel on guard duties.

The camp was taken over by British forces; and on April 15 the British military commander and a high-ranking officer of the medical services interviewed the SS commandant Joseph Kramer. A preliminary general survey was made. On April 16 a broadcast to all prisoners told them that the camp had been liberated by the British armies. Arrangements were made for medical units to be sent to the camp to deal with the typhus epidemic and the generally atrocious medical conditions the survey had revealed.

On the same day a detailed inspection of the camp was made and a meeting of all qualified medical prisoners was summoned. About 100 medical prisoners attended this meeting, many of them women, and the proposed arrangements were explained to them. Food had already arrived and water; the camp water-supply consisted of two or three small concrete ponds within the camp, and these were fed by means of an electric pump for which there was no longer any current.

Next day, April 17, medical units arrived at the camp, and a British medical officer in command of a casualty-clearing station took over the duties of senior medical officer and medical adviser to the British Forces in the area.

CAMP AND BARRACKS

The survey showed that the camp consists of two areas. Camp I is a hutted camp made up of 5 main compounds (three for men and two for women), divided by wire, and an enclosure containing administrative huts, all enclosed in a wired-in perimeter. Camp II is a portion of the neighbouring barrack area, normally used for SS and Wehrmacht, which had recently been taken over for reception of 16,000 males arriving from other camps.

Camp I.—The prisoners on April 16 numbered 28,185 women and 12,000 men (approx.). The men's compounds contained 1500–8000, while the two women's enclosures had 23,000 and 5000. In the larger women's enclosure were about 500 children.

Conditions varied considerably in the compounds; some huts had bunks, in two or three tiers, while in others the prisoners just lay crowded on the floor. Except in men's compound no. 3 certain huts were set aside for use as hospital huts. Not all of these were bunked.

In the women's compounds prisoners acutely ill, suffering from definite diseases, exclusive of malnutrition, numbered about 2000. For these women there were only 474 bunks, each being occupied by 2 or 3 women. The remainder, including almost all the typhus cases, lay on the bare boards. In compound 2 only one hut was set aside for the sick and it was without bunks. In this compound typhus cases were not segregated.

In the men's compounds hospital conditions were worse than in the women's compounds but there were more bunks (1959 for 2242 acutely ill cases). One compound had no huts for hospital use.

The camp had five cookhouses (two for men, two for women and one mixed). As a rule two or three cookings had to be done for each meal. The food consisted of a soup of vegetables—mainly carrots, dried cabbage and potatoes—thickened with meal. Very occasionally small amounts of meat were added. The number of meals varied from two to three per diem.

Latrines were practically non-existent. When there were any they consisted of a pit with a bare pole over it. They were unscreened.

The administrative block, outside the main compounds, consisted of a main office building and living huts for guards and administrative personnel. There was also a [illegible]ll building, with a few ablution benches, and a larger containing four [illegible] chambers each capable of doing 60 [illegible] 1½ hours. Here there were also 15 [illegible] guards and administration.

Camp II consisted of accommodation taken over about a week previously and was grossly overcrowded. There were no cases of typhus, and general conditions were better than in older camps. One block had been set aside as a hospital.

The barrack area.—Adjoining the two main camps was a magnificent barrack area, with every possible facility for the German troops—good canteens, cookhouses, garages and stalling, a cinema, good married quarters, and a beautiful German officers' mess. There were also eight hospital blocks, containing, when the British took over, 604 German military patients. In beautiful surroundings just beyond the officers' mess was an excellently appointed military hospital. The contrast between the concentration camp for the slaves and the A1 barracks and amenities for the *Herrenvolk* could scarcely have been greater.

CONDITIONS ON ARRIVAL

On April 15, before our detachments arrived in sufficient strength to take over all duties, the commandant Kramer was interviewed by the military officers sent to survey the conditions. While this interview was proceeding a runner arrived to say that the SS were firing on prisoners. It was found that famished prisoners were trying to take potatoes from a heap near the cookhouse and the SS were shooting them. Kramer made no attempt to stop his men. Nor was any attempt made by the Germans to help the wounded and the dying. Kramer was at once told that one SS man would be shot for every prisoner shot, and this stopped the killing. Kramer was made to assist personally in removing the dead and wounded.

At the bottom end of the camp was a crematorium consisting of one oven. It had not been used for some time because the number of deaths had been increasing too quickly. Near the crematorium were several mass graves in pits which were earthed over. On the south of the camp was a pit approximately 25 × 8 × 4 yd., in which were many blackened corpses.

On the way to the pit two large piles of naked corpses were passed; all of them were mere skeletons. Many dead bodies were seen lying clothed at the side of the road. There were also many dead in the gutters alongside the huts. The vast majority were fearfully emaciated. The following figures, though only approximate, give a picture accurate in its main lines. But the numbers are understated in terms of any normal health statistics.

Women (28,185).—Acutely ill in hospital huts, 2000 (in 474 bunks and on floor). These included: typhus 550, enteritis and typhoid 394, tuberculosis 68, respiratory conditions 263, surgical cases 178, and other diseases 511. Requiring special treatment but not in hospital huts, 8600, including enteritis 500 and tuberculosis 200. Daily incidence of new cases, 125.

Men (12,000).—Acutely ill, 2242 (bunks 1959). These included typhus 305, enteritis and typhoid 644, tuberculosis 400, cachexia 460, surgical cases 216, and other diseases 300. Requiring treatment but not in hospital huts, 7000. Daily incidence of new cases, 59.

MEASURES OF IMPROVEMENT

By the afternoon of April 16 (first day of taking over) 27 water-carts, and food for all for an evening meal, were provided. An official report states that "the psychological effect of this provision was amazing, and each day the atmosphere in the camp has improved, changing from one of extreme apathy through the gradual appearance of a spark of vitality to real joy and an interest in life." Special diet is provided for starvation cases.

On April 17 the following medical units were moved in: one casualty-clearing station, one light field ambulance, two field-hygiene sections, and one mobile bacteriological laboratory. Immediate steps were taken to obtain (1) protective clothing, (2) large quantities of sulphaguanidine. It was proposed to establish at once welfare services, including postal facilities—this latter being probably one of the most important elements in restoring the sense of freedom. Help from UNRRA was asked for, and from the Red Cross.

one these g ntities of all forms of clothing and Ordnance since they a lemanded—supplies to be partly from cap- hand they n stock. Women's clothing has been de- private pa German civilian supplies.

who res of captured German drugs and dressings are available. All food of a luxury nature and suitable for special feed
local hospital
supply of eggs
districts. The
civilians in the area near Belsen is described as very high. The rosy-cheeked plump children and young women are particularly noticeable.

Those who have seen the camp say that the photographs reproduced in the press do not reproduce the worst horror, which could be appreciated only inside the worst huts.

Camp I is to be evacuated completely and there is a strong desire to "destroy it by fire." Some of the prisoners have left Belsen already and others will be evacuated as soon as their physical condition permits. Typhus inoculation was carried out on all who needed it.

The epidemic aspect of the situation in this and other camps is under control. The dusting of all contacts with powder containing DDT is also applied to all displaced persons or returned Allied prisoners of war—now known as PWex to distinguish them from POW, these being the enemy prisoners in our hands. Authorities on the spot
d already
And no
s appear-
DPs and
PWex who have now come into Allied hands. With the extension of railway facilities again into Germany, and the opening of roads now made possible by German surrender, a very big job opens up for the medical services. But it is a job which can be done, as has already been proved at Belsen, and other places in the control of disease among DPs and in the admirable arrangements for the British ex-prisoner returning to his homeland.

A special word is due to the interned doctors, men and women, at Belsen camp. The women's camp was better than the men's
to procure ord
one hut with
that they could hardly raise their heads, and the women in the bunks and passages were crowded, dead and living, together. There was an area for the children, but immediately adjoining it there was a very large area in which many hundreds of dead naked women were piled high. Yet the care that had been taken of the children was most noticeable. And medical help went on whatever happened. One woman gynæcologist was conducting all the obstetric cases, 5 to 7 a day, and for several days had had to work without water. A report from a British medical officer says: "It is impossible to speak too highly of the efforts of certain women doctors."

NATIONAL HEALTH SERVICE

THE following resolution was adopted unanimously at a conference summoned by the Socialist Medical Association and held in London on April 15:

This conference considers that a comprehensive national health service is essential for the people's welfare. It believes that nothing less than the Government's proposals contained in the white-paper on a National Health Service will result in a satisfactory service for the people.

Conference therefore calls on the Government to introduce legislation during the present parliamentary session and not to let itself be influenced by those forces which stand in the way of social progress because they are not prepared to give up their positions of privilege. Conference protests against the Governme
ith an
interested o
e not
represented,
House
of Commons.

Knowing that powerful opposition from a reactionary minority will have to be overcome, the organisations represented at this conference pledge themselves to rally all possible support for a National Health Service throughout the country.

TEACHING OF PÆDIATRICS

THE care of children is possibly the most important duty c
pædia
seeks
medical curriculum.

The student's attention, it is suggested, should be directed to growth and development of children while he is still learning biology, physiology, and anatomy; and the diseases and morbid processes peculiar to childhood should find a place in his studies of pathology and psychology. During his midwifery course he should be taught by a pædiatrician about health and disease in the newborn; and he should also spend 8 sessions at a child-welfare centre, where he will learn from either a pædiatrician or a suitably qualified maternity and child-welfare medical officer. Courses in the care of the newborn and in child welfare should precede his course
ics, which itself should occupy,
less than a third of the whole
clinical medicine, and should
of a month. In the study of social medicine the social services dealing with children should be given proper weight; the student should have a chance to gain some insight into the school medical service, child-guidance centres, and children's courts.

THE TEACHING UNIT

The structure of the pædiatric department has been given some thought. The committee *feel* that the hospital centre, closely linked to a university and with
to it, has much to
ent of pædiatrics,
l forward teaching
and research, and would be entitled to support from the University Grants Committee. Alternatively, the university pædiatric department might be developed as part of a general undergraduate teaching centre admitting 80–100 students a year. In any case it should have at least 100 beds for general medical and surgical cases, and possibly additional beds for children needing tonsillectomy. At least 20 more beds should be set aside for infectious diseases,
be linked to an appropriat
should also have access t
orthopædic hospitals, and
children, so that they can study chronic disease in childhood; and they should see reablement properly applied in convalescent homes.

If the department is placed in a general hospital all children admitted to the hospital should be considered as admitted to the children's department, and shoul be under the general care of the pædiatrician in associa tion with the surgeons or specialists treating each chil

In London much larger children's units will have be developed in many teaching schools; meanwh students should be able to get the necessary experie at children's hospitals. In provincial schools children's hospitals will continue to provide the n teaching in pædiatrics, though these should in course become university centres. In teaching, e possible use should be made of local-authority serv and voluntary and municipal hospitals should borate with the universities, freely interchanging with them and with each other.

The staff of the children's department, it is sug should consist of a whole-time director (of prof rank), a whole-time assistant (preferably a a whole-time senior assistant, a registrar, and house officer. Also there would be two p pædiatricians of the standing of physicians or physicians. A senior member of the patholog ment should take a special interest in the pat diseases of children, and similarly a senior r should have a special interest in their X-ray

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1. Royal College of Physicians of London: Inter Pædiatric Committee. April, 1945. The co Lord Moran (president), Prof. L. G. Parson Langmead, Mr Fardley Holland, Dr. Donald Wilson Jameson, Prof. J. C. Spence, Prof. S. Helen Mackay, Dr. Alan Moncrieff, Dr. J. R. C. Lightwood, Dr. Aubrey Lewis, Dr. H. R. V. Christie, Prof. Charles McNeil, Dr. I Dr. Jean Mackintosh, and Sir Allen Daley.

consultant psychiatrist should be attached to the centre. The nursing staff should be expert and chosen for capacity to teach students the nursing care of sick children.

EXAMINATIONS AND QUALIFICATIONS

In the qualifying examination pædiatrics should loom larger. It is proposed that in the Conjoint final, for example, pædiatric questions should appear in the proportion of one to four on general medicine—that is, at least one pædiatric question in each paper on medicine. These questions would be set and marked by the pædiatric examiners, who would also take part in the oral examination of the candidate. In addition there should be a separate clinical examination in pædiatrics. If students are to have a compulsory resident year in hospital, the committee hope that as many as possible will be given a pædiatric appointment.

Finally, the committee have made suggestions for postgraduate training. Consultant pædiatricians, they consider, should have held a registrar's or first assistant's post in an approved children's hospital or department. They should have a minimum of five years' approved training and experience after qualifying, the first year to be spent in appointments in adult medicine or surgery; and they should spend three years in pædiatrics, though one such year may be devoted to an allied subject—e.g., to work in a maternity unit, a fever hospital, or a psychiatric children's department, or to laboratory work or travel. Consultants must hold a higher degree in medicine and a recognised hospital appointment; they must not engage in general practice.

Until the general form of a consultant service has been worked out, suitable "consulting physician-pædiatricians" might be recognised in towns and districts without teaching schools.

The committee hope to see the development of refresher courses for general practitioners under the Ministry of Health scheme. In the public health services they look forward to separation of child-welfare work from the maternity services as regards staff, though there should be a close liaison between the two in other ways. They think it undesirable that medical officers should give their whole time to child welfare and school medical work, and also that they should have the opportunity for clinical work among sick children, either in general practice or through a hospital appointment. Such doctors should hold the diploma in child health; but they should not be eligible to sit for this examination until at least a year after qualification. The examination would be the better, it is felt, for more emphasis on the preventive side; and one of the examiners should be engaged in child-welfare work. The committee also hold that the universities should be encouraged to allow candidates to take an MD examination in pædiatrics, provided it includes a paper in general medicine.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED APRIL 28

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1426; whooping-cough, 1190; diphtheria, 564; paratyphoid, 3; typhoid, 3; measles (excluding rubella), 16,023; pneumonia (primary or influenzal), 530; puerperal pyrexia, 128; cerebrospinal fever, 56; poliomyelitis, 5; polio-encephalitis, 0; encephalitis lethargica, 2; dysentery, 486; ophthalmia neonatorum, 59. No case of cholera or plague was notified during the week, but there was 1 imported case of typhus at Amersham, Bucks.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on April 25 was 1113. During the previous week the following cases were admitted: scarlet fever, 55; diphtheria, 26; measles, 151; whooping-cough, 15.

Deaths.—In 126 great towns there were no deaths from enteric fever, 2 (0) from scarlet fever, 8 (1) from measles, 4 (0) from whooping-cough, 7 (0) from diphtheria, 43 (8) from diarrhœa and enteritis under two years, and 12 (2) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was rresponding to a rate of 27 per thousand total including 21 in London.

In Engla

A Running Commentary by Peri

To a Scotsman, the pre-war Londo to lack a little in stamina and stability; he was too complacent, too easy-going, too ready to make the most of his little difficulties. But in the past five years he has been truly magnificent. He took the 1940–41 blitz in his stride, and his amazing good humour and resiliency carried him through those nerve-racking days with little mental blemish. In the fifth year of the war, he withstood the flying bomb, the damaged home, the delayed repairs, the lack of warmth and light, the rockets, the queues, and the shopping difficulties, still with a joke, still carrying on. Among my own small group of colleagues, between a quarter and a third were completely "bombed out" both in the blitz of 1940–41 and the flying bomb period; yet the output of work increased and only a slightly greater sickness-rate and a casualty claimed by the tubercle bacillus indicated the mental and physical strain. Superficially, these war years have had no obvious effect on the mind of the Londoner, but I think he has learnt something. He has a greater sense of responsibility; he talks a good deal about the future; he reads the newspapers more critically and thinks a little more for himself. Something of the same spirit is abroad, we are told, among Servicemen. There is a realisation of much work to be done, and with better wages and conditions of service, less talk of "exploitation"—that bogy word that has long stood as a barrier between master and man. Perhaps I am being over-optimistic, for ours is largely a technical staff of good average intelligence. Certainly one meets just now too many of the other type; the irresponsible, looking only for opportunities of avoiding a decent day's work. But many of these men are old or misfits, and we may hope that with the return of disciplined and thinking men and women from the Forces, the tradesman, the shop-assistant, the artisan will again win the respect and admiration we readily give to anyone who has learnt a job and does it well.

* * *

Victories notwithstanding, the important fixtures of peace still have to be tucked into odd hours and scraps of leisure; and a hurried scamper round the Royal Academy in the fading light of the hour before it closes is almost lèse-majesté. But the official in splendid red robes who guarded the portals, and sternly turned us all out on the dot of 7, did something to uphold ritual and tradition. Also the beards and hats of the onlookers made a brave show in the pre-war manner, and flower pieces, landscapes, and portraits of children hung beside uniform and battle pieces.

Dr. Henry MacCormac's portrait, by A. R. Middleton Todd, looked almost as kindly as the original. The late F. Ernest Jackson contributed a portrait of Sir Harold Whittingham in profile and uniform beside his microscope, and an interesting study of Mr. Somerville Hastings, unfortunately unfinished. Cyril Roberts's portrait of the late Dr. G. C. Anderson had to be drawn from photographs, but it is good enough to make us regret the portrait he might have painted from life. A striking portrait in the laboratory manner by Meredith Frampton is of Mr. Clive Forster-Cooper, SC D, FRS, director of the Natural History Museum, surrounded by the impedimenta of his science. Rodrigo Moynihan's study of Miss Borne, matron of Papworth Village Settlement, is one of the best in the exhibition. E. Dalton Hewland in a pleasant Nursery Interior shows Dr. Greta Malmberg with Josephine and Richard. R. Sinclair Smith's Cod-liver Oil catches a moment in a war-time nursery at Hull, and Malvina Cheek's Blood Transfusion Service shows another war-time activity in full swing from donation to the inevitable rewarding cup of tea. Among the sculpture Dora Gordine has a benign bronze head of Mr. Aleck Bourne, and Joseph Henelt an anonymous Head of my Doctor. As usual the whole thing seemed less academical than one expected.

* * *

It has been interesting to study the ætiology of mass behaviour. Ever since this town was liberated, and the more substantial collaborators set free after "trials" which seemed to satisfy no-one but the victims, discontent has been universal but inarticulate. One by

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THE LANCE 12, 1945

Large qua
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one these gentry opened up their factories or shops, and since they alone had still the requisite raw materials to hand they prospered. Last week one of them gave a private party to celebrate Hilter's birthday; while a lady whose husband is still serving in Germany with the Reichswehr was returned from "protective arrest" in her own luxurious car. People in cafés started to murmur openly.

Information that the town's twenty hostages, removed by the Germans, were interned near Weimar gave renewed hope to their relatives as the Allies drew near to that area. Suddenly came the descriptions of Buchenwald camp, together with a rumour that all these hostages were dead. A wave of horror and lamentation swept the town, and the photographs from the British newspapers were circulated, but clandestinely in deference to the feelings of the families. One night the ex-burgomaster returned, a shadow of his former self and still dressed in his prison rags. A meeting of *La Résistance* was summoned.

Next morning a large yellow poster was to be seen in the market-place containing the names of ten families notorious locally for their Nazi affiliations; and informing them that they had 48 hours in which to leave the town. This naturally caused great excitement, and a crowd which consisted mostly of school-children, young adults hoping for excitement, and unemployed factory workers stood all day outside the guilty houses, just waiting. Within twelve hours five of the families had "flitted" and their houses were decorously looted. Another announced its intention of staying owing to the illegality of the proceedings, whereupon, rather illogically, the gendarmerie turned up and removed them to the jail, followed by a howling mob. They were released the next morning, but decided to adopt the better part of valour, and they too were no more seen.

Encouraged by the course that events had so far taken the resistance movement produced a further poster containing ten more names, and emphasised the moral with three hand-grenades through selected windows after nightfall. Earlier in the evening a blond young man belonging to one of these families had been caught by the crowd and marched roughly through the main street. But just as things were beginning to look ugly for him they decided to hand him over to Justice—a triumph of hope over experience, since he also was released next morning.

It seems that as the result of this skirmishing leaders have emerged during the night, since bands of men—no longer noisy and hysterical but sullen-looking and purposeful—are now gathering all round the market-place, and big stuff is expected tonight. . . .

* * *

Unlike my fellow peripatetic of April 11, and his opposite numbers in the *Evening Standard* and the *Evening News* of April 16, I have looked up the facts about the new Japanese premier. St. Thomas's, I gather, has been unruffled by this leg-pulling, as well it might be. A hospital which can claim to have produced a Dominion premier (Sir Godfrey Huggins), one of the greatest novelists of the day (Somerset Maugham), and a sociologist of the standing of Havelock Ellis, is not going to be flustered by rumours about enemy statesmen. But, in the great name of Truth, perhaps the facts should be told. They are these. In 1886 a Japanese student from Tokyo, named Shigemichi Suzuki, who had already qualified in Japan, entered St. Thomas's as a "special student," and is shown in the Medical Register as having been registered with the conjoint qualification on Dec. 21, 1887. In the *List of Old Students of St. Thomas's* for 1938 (the last published) this Suzuki is put down as "Surgeon Vice-Admiral, Imperial Japanese Navy (Retired)." According to the *Times* of April 6, the new Japanese premier is Baron Kantaro Suzuki, who at various times has been commander-in-chief of Japan's combined fleet, Supreme War Councillor, chief of the Naval General Staff, and grand chamberlain to the Emperor. St. Thomas's is no doubt proud of the type of doctor it produces, and the Japanese may be a versatile race, but I find it hard to believe that even a Japanese doctor trained at St. Thomas's could have attained to these giddy naval heights. To make doubly certain, however, I consulted the Foreign Office, and so far as is known there Baron Kantaro Suzuki is not even connected with Vice-Admiral S. Suzuki. Suzuki is an extremely common name in Japan, and herein lies the plebeian explanation of the coincidence which has misled three gullible journalists.

* * *

By exercising a good deal of "graft," a Belgian friend managed to take me to see a cock-fight recently. Here, as in Engla [illegible] seems to be [illegible] rather than the reverse.

I have always wanted to see a cock-fight, chiefly on account of some 18th century prints which I possess, in which the attitudes of the combatants are picturesque but so improbable that I was surprised to find that they are in fact remarkably accurate. On arrival at the rendezvous we found a strange absence of any cock-fight, or any apparent knowledge of one. It transpired however just as we were leaving that there had been a little trouble with *les gendarmes*, and that the alternative scene of operations was 5 kilometres further on. This we found to be a big barn at the back of a small pub, in the centre of which was a large square table edged with chicken wire. Surrounding this were several rows of chairs, then tables, and further out still benches on tables. I was lucky enough to be allotted a chair balanced on a form which was placed on a table, and so had an excellent if somewhat precarious view of the proceedings.

The evening's combat, which was for no less than 10,000 francs, was between two small manufacturing towns, whose artisan supporters far outnumbered the agricultural locals. Civic patriotism combined with the spectacle seemed to be the real attractions, as side-betting or sadism were no more apparent than at an English football match. Sharply on time the representatives of the opposing sides stepped into the ring, each with a dark canvas bag such as lawyers use to carry briefs, and out of each was produced a fine game-cock. The spurs were then carefully inspected (a trace of cyanide on these is not unknown), and the birds were placed on the ground. As soon as they caught sight of each other they rushed madly together, beating their wings and jumping in the air to strike with their spurs. This continued at full tempo for some 30 seconds, after which both birds appeared to be completely exhausted and lay down. [illegible] until I noticed the spastic gait [illegible] gained his feet, when a modicur [illegible] (in a country where racing pigeons are fed on Fowler's solution) pronounced the answer to be strychnine!

These short sharp periods of combat were then repeated, fascinating in their intensity and rhythm. It reminded me of the ballet, which I should judge owes something to it. Each round lasted exactly 9 minutes, and when there was no kill, as was the case in about half of the eight rounds, the cock which was standing at the time was adjudged the winner. Both combatants were [illegible] octored [illegible] to the [illegible] no less than 500–600 francs as table birds.

T[illegible] eux, much indi[illegible] when—as som[illegible] "yellow" [illegible] y the other, the audience [illegible] Rommel"; which they [illegible] Hun visitor was just the name of the unfortunate bird. This is still done, although some of the younger members of the audience seemed already to be unaware of its origin.

* * *

The Admiralty seem to have forgotten me; so another of their humble, and, if it is fair to judge payment by work, overpaid servants languishes in sunny Italy. Will the future national medical service have such sinecures? If so, I feel the sponsors ought to tell us the prospects. Meanwhile this leisurely life develops a great sympathy for the unemployed and an insight into their mental problems.

Once a week I set up shop for the peasants on an estate some miles inland, the local doctors being somewhat few and far between. My dispensary consists of a bottle of aspirin and a bottle of ferrous sulphate, pills that I hand out more or less alternately; but the germ of success must still be alive because the peasants always come back for more, or perhaps it is only the sweets for the children that are the attraction. Obtaining my two precious bottles was a fine exercise in red tape, for I was passed through three offices of various nationalities before the necessary signature was obtained, but once I had reached the wholesale druggist in his little room in a tumbledown villa the rest was easy, and now I go to him directly for refills.

The local diseases of course bear a close relationship to environment, the highlights of a pleasant round on foot through lovely wooded country being two cases of nephritis, one of sciatica, one acute rheumatic fever, a Sydenham's chorea, and plenty of bronchitis, while the two bottle-fed babies are rachitic. The cottages, warmed a little at night by the oxen, have only the charcoal fires for cooking, and their brick floors make the rooms bitterly cold in the winter. The peasants are short and stocky and the children show signs of poor nourishment.

A remarkable custom in each farm house is the production of a pile of boxes of assorted ampoules for my inspection and advice as to which would be best. They have great faith in the needle, and judging by the contents, as described on the box, they need it. These drugs are of German and Italian manufacture and contain such drugs as calcium salicylate, iron salts, and various more abstruse drugs in minute dosage. Human nature is the same the world over, and many of the older people really just come to see the doctor and hope he can give an injection to cure the eternal *debolezza di nervo*.

They pay me with eggs and bottles of vino. but just what the Admiralty get for their money is not very clear.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

IN answering a member who protested at the inadequate time to be allowed for a Scottish debate last week Mr. Churchill said "We live amid rare occasions." And this phrase expressed the mood of the House and the preoccupation of the whole nation with the closing chapters of the war in Europe. Nevertheless Parliament carried on; gave a second reading to the Education Bill (Scotland) and long consideration to the Requisitioned Land and War Works Bill. The heart of the matter however was in the various statements about VE (Victory in Europe) day and the Prime Minister's momentous announcement of the unconditional surrender of the enemy in Italy.

It is, however, quite clear from information now pouring in from Europe on such problems as the concentration camps that there is only a shifting of responsibility from the shoulders of the fighting forces to those of the military government of Germany. The demarcation of the zones of occupation of British, American, Russian, and French forces have to be finally agreed, and the detailed solution of the problem of moving the vast army of slave workers now in the Reich territories to their homes has yet to be worked out. In the British zone alone there are about 1½ million Russians, Poles, Czechs, Slovaks, and Yugoslavs who will go East and 1 million French, Belgians, and Dutch who will come West, and it is certain that the numbers in the Russian, American, and French zones will rival these figures. Parliament's first "peace" duties will be concerned with such matters on which the immediate stability of Europe will depend. It is reassuring to know that the control of the evacuation of Displaced Persons is well in hand in the British zone and that in this, as one may say, dawn activity of peace the British Army is proving itself as efficient as it has proved itself in war. It is also worth noting that a large part of these activities depend for their success on the high level of the Army Medical Services upon whom a great responsibility falls.

FROM THE PRESS GALLERY

National Loaf

IN the House of Lords on May 2 the Earl of LISTOWEL [illegible] Lord HANKEY that home-milled flour for use in the national loaf is of 80% extraction, both from home-[illegible] wheat and imported wheat. As regards imported flour, this is around 75% extraction, but it is not used separately in the production of national bread. Generally imported flour is included in national flour by mixing in at the mills with home-milled flour to the extent of 15% of the total product. In Scotland a further 12½% of imported flour is permitted to be used by bakers in certain varieties of national bread. The vitamin and mineral content of wheat depends upon the variety but even with the same variety it may vary from year to year. In a recent investigation carried out jointly by the Department of Medicine, Cambridge, and the Cereals Research Station, St. Albans, average figures were obtained on samples of home-grown wheat and imported Canadian wheat. This latter contributes the bulk of our imported wheat. The figures which are given in parts per million are as follows:

	Canadian wheat	*Home-grown wheat*
Vitamin B_1	3·6	3·0
Riboflavin	1·7	1·7
Nicotinic acid	55	48
Iron	38	30
Calcium	275	355*
Magnesium	1410	1060
Zinc	37	32

The imported flour which is mixed in with home-milled flour is almost entirely Canadian flour. Analyses last year of a number of samples of this flour gave the following results:

B_1	3·0	Nicotinic acid	14·0
Riboflavin	0·75	Iron	11·0

QUESTION TIME

Sale of Medical Practices

Mr. S. STOREY asked the Minister of Health whether he had any statement to make on the sale and purchase of medical practices in relation to the Government's proposals for a National Health Service.

Mr. WILLINK replied: The Government recognise, as indicated in the white-paper, that a case can be made for the total abolition of the sale and purchase of publicly remunerated practices, and particularly practices conducted in publicly-provided health centres. The Government also recognise that the abolition would involve great practical difficulty and is not essential to the initiation of the new service. The Government feel that firm decisions dealing with the practical difficulties fairly in the interests of all concerned if sale and purchase were to be abolished could be reached only after some experience had been gained of the working of the new service and all the relevant facts had been ascertained. The Government do not propose, therefore, to make any alteration in the present custom in the forthcoming Health Services Bill, but they propose that a full inquiry into the whole question shall be instituted by a committee appointed for that purpose after the new service has come into operation and experience of its working has been gained. Meanwhile, to remove any present uncertainty, the Government wish to make it clear that, if the sale of practices—as a result of the inquiry—should be abolished or restricted by law, doctors affected would receive *all* proper compensation on the understanding, of course, that the new service could not be allowed, by itself increasing values, to increase the amount of compensation payable. The Government also recognise that, pending the inquiry, many doctors will be returning from the Forces and entering new civil practices under the existing conditions of practice exchange. They are anxious that these men and women shall not be prevented or discouraged from doing so by inability to find purchase money, and they are discussing with the profession how this can best be secured.

Poliomyelitis in Mauritius

Colonel O. STANLEY, Secretary of State for the Colonies, replying to Mr. R. W. SORENSEN, said he regretted that an outbreak of infantile paralysis occurred in Mauritius in March, and 1071 cases were notified up to the end of April. Medical and nursing staff were immediately loaned by the governments of Kenya, Tanganyika, and Uganda, while the authorities of Oxford University made available the services of Prof. H. J. Seddon, Nuffield professor of orthopædics, who proceeded to Mauritius by air accompanied by a research specialist, Dr. Allan McFarlan, from the Medical Research Council, and a masseuse. A special orthopædic hospital had been opened under Professor Seddon's supervision and two medical officers loaned by the Royal Air Force and the Army respectively were cooperating in research work. Instructional [illegible] was [illegible] The [illegible] 20, [illegible] h 24.

Relief Work in Europe

Mr. A. Henderson, Financial Secretary to the War Office, replying to Mrs. M. Tate, said that voluntary societies were assisting in relief work at several liberated Nazi concentration camps, in particular the British Red Cross Society at Belsen and the Swedish Red Cross elsewhere. Further, to fill a most urgent need, Sir Jack Drummond, FRS, nutritional expert of the Ministry of Food, and a number of trained personnel together with two Unrra representatives were en route for Germany to administer famine treatment with predigested food to inmates of camps suffering from the effects of starvation. He undertsood that the organisation of teams for child welfare was now being considered as a matter of urgency.

Compensation for Pneumoconiosis

Mr. G. H. Oliver asked the Minister of National Insurance whether he was aware of the anxiety which was felt by coal trimmers, anhydrous miners, and workers engaged in industries which exposed them to the inhalation of silica, asbestos, and other dust, and who had contracted pneu- [illegible] Minister would be prepared to consider some suitable extension of the compensation schemes for pneumoconiosis when an adequate number of doctors qualified to carry out the necessary medical examinations was available. The operation of the existing schemes was being severely hampered by the shortage of doctors, and the Minister therefore could not contemplate extending them at the present time

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On Active Service

CASUALTIES

DIED OF WOUNDS

Captain T. J. Seavers, RAMC

MISSING PRESUMED KILLED

Surgeon Lieutenant Alastair Simpson Bell McNeil, MB EDIN., RNVR

WOUNDED

Surgeon Lieutenant G Smith, RNVR
Captain Peter Delap, MB DUBL, RAMC
Captain K G. Green, MRCS, RAMC
Captain C. W. Mearns, MB BELF, RAMC

AWARDS

MC

Captain J. D Fisher, MRCS, RAMC

MENTIONED IN DISPATCHES

THE NAVY

Surgeon Lieut Commander J E Hughes, MS, FRACS, RANR

Surgeon Lieutenants

J H Begg, MB, RANR
G L. Grove, MB, RANR

THE ARMY

Majors

P Baker
G A S Akroyd
J Donaldson
J W N. Duerden
C R Houghton, MBE
J S McCrae

Captains

O C Coit
D W. Evans
P. Firstenberg
H. A Gibb
L C L Gonet
E. J Harrison
D C. Langwill
P. Luckett
J R McGregor
P M. M Pritchard
T. B L Roberts
J R D Williams
T A Taylor

INDIA

Major E A. Tarleton

Captains

K. L Chitwal
F P. O'Neill

MEMOIRS

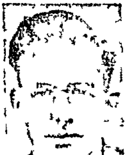
Lieut [illegible]
on March [illegible]
dine O'N [illegible]
From Robert Gordon's College, he entered the study of medicine at Aberdeen University in 1908, graduating in 1913. A hard working, conscientious student, he gained one of the medals in clinical medicine, and already showed the sound judgment and clinical acumen that were to stand him in good stead. After a year on the house staff at the Aberdeen Royal [illegible] the field ambulances attached to a Highland division, he was awarded the Military Cross, and while attached to one of the 2nd Cavalry Division field ambulances he was mentioned in despatches. After the Armistice, he remained in the Service, and was sent on a tour of foreign service in India, where he saw action on the North-West Frontier. He was appointed OBE for his services in this campaign. But a severe attack of dysentery left its mark on him, and in 1923 he resigned his commission and returned home to settle in Greenwich, where [illegible]

At the outbreak of this war he was recalled to the Forces, and was in charge of a base depot near St. Nazaire till its evacuation. He sailed for the Middle East early in 1941 in command of a light field ambulance, and took part in the [illegible] until appointed ADMS of a [illegible] despatches for his work. [illegible] thrombosis developed in 1942, and he never returned to service. But his letters show that he bore a long and trying illness with fortitude and cheerfulness Colonel Argo's outstanding characteristics were his sense of duty and charm of manner, both of which endeared him to patients. He was thorough in his investigation of cases, and remarkably accurate in diagnosis, and his colleagues set great store by his opinion.

J. O. J.

Captain G. Spencer Sheill, MC, who died of wounds in Germany on March 24 while serving with an airborne division, was the only son of Dr. and Mrs. J. Spencer Sheill, of Donnybrook. He was born in Dublin, where he received his early education, and later he spent three years at Epsom College. In 1939 he graduated MB at Trinity College, Dublin, and for a time he was an assistant in a general practice in York. But at the outbreak of war he volunteered at once for service abroad with the RAMC. After the evacuation from Le Havre he was mentioned in despatches for gallantry, and he also served at Gibraltar and in the Med[illegible] his [illegible] late [illegible] Montgomery. He was engaged to Dr. Mary Rennie, RAMC, of Dundee "I learned to appreciate Spencer Sheill's quality during the time he acted as my resident," writes one of his chiefs at the Royal City of Dublin Hospital. "Rather shy and quiet, his likeable boyish simplicity was backed by resolution and practical ability, and he was at once industrious, skilful, and utterly reliable." He was 28 years of age.

Captain J. H. Richardson Barker, RAMC, was the only son of the late W. H. Barker, head of the department of geography in the University of Manchester. He was educated at Manchester Grammar School and graduated MB Manc. in 1940. He had chosen surgery as his specialty and after serving as house surgeon at the Ancoats Hospital he spent a further six months there as orthopædic house surgeon before he joined the RAMC While on night manœuvres he sustained a severe compound fracture of his forearm and for several months was under treatment. In July of last year he was posted to East Africa where he served with the King's African Rifles, and he was happy in his life with his regiment Later he was transferred to Mauritius where he contracted infantile paralysis and died within three days. As a student Barker was quiet, keen, and thorough As a house-surgeon he was reliable and conscientious A helpful and friendly man, dexterous and neat in his work, the patients were fond of him, the nursing staff long regarded him as the ideal house surgeon, and the honorary staff found him a faithful and capable assistant.



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Letters to the Editor

AN UNDERGRADUATE MEDICAL SCHOOL AT OXFORD

SIR,—The report of the Goodenough Committee has been received with little open criticism, partly because any medical school which refuses to fall in with its recommendations is likely to find itself at a considerable financial disadvantage. As Oxford graduates, however, we feel bound to put forward some criticisms of that section of the report which deals with the University of Oxford. (Chapter 6, paras. 41–52, pp. 122 to 125.)

Shorn of its trimmings the suggestion put forward by the university and apparently approved by the Goodenough report amounts to the foundation of an undergraduate clinical school to train "teachers, investigators, and consultants rather than general practitioners." This involves two assumptions which we believe to be quite unjustified: the first, that medical students before having started on the clinical period are in a position to determine what type of medical career they wish to take up; the second, that there is at this stage in their education any means of selecting those who are likely to prove efficient "teachers, investigators, and consultants."

We teachers who have long been in close touch with undergraduate medical schools realise only too well that it is impossible to prognosticate the development of any particular medical student during his three years of clinical work. Some who have covered themselves with honours in the preclinical period fail lamentably as clinicians; others with chequered careers in their preclinical studies may ultimatly prove quite outstanding both as clinicians and teachers.

It must be remembered that some of the greatest figures in medicine, such for example as Sir James Mackenzie, spent many years as general practitioners. It may well be that every potential consultant or teacher would benefit far more by a period in general practice than by three years of study in the "rarefied atmosphere" (vide Goodenough report, page 124) of Oxford.

Few undergraduates go down from Oxford without feelings of poignant regret, and many medical students at the impressionable age at which they normally leave Oxford would wish to remain there to complete their clinical studies. As a result the suggested undergraduate school would be likely to be filled mainly by those with sentimental attachments to Oxford. Those who, perhaps, with the assistance of their parents, took a broader view of their future medical education would continue to go to teaching hospitals in London or elsewhere.

It is probable that should such an undergraduate school as is envisaged in the Goodenough report come into being it would within a few years die of inanition. In the meantime, however, it might well have dealt a severe blow to the opportunities for research and postgraduate teaching which were visualised as the fruit of Viscount Nuffield's benefactions. The Nuffield professors were not selected with a view to their becoming teachers of undergraduates, and the strain of an undergraduate teaching school would necessarily considerably restrict their more vital functions.

We trust that the university will not attempt to implement the recommendations in the report without further consideration.

G. H. BATEMAN
G. E. BEAUMONT
DENIS BRINTON
W. D. W. BROOKS
L. R. BROSTER
L. GRAHAM BROWN
MAURICE CAMPBELL
J. J. CONYBEARE
ERIC A. CROOK
P. G. DOYNE
TERENCE EAST
CECIL FLEMMING
MYLES L. FORMBY
C. M. HINDS HOWELL
NEILL HOBHOUSE
THOMAS HUNT
G. L. M. MCELLIGOTT
GEORGE E. NELIGAN
W. H. OGILVIE
R. S. BRUCE PEARSON
WILFRED J. PEARSON
J. H. PEEL
ARTHUR E. PORRITT
MAURICE SHAW
E. B. STRAUSS
C. P. SYMONDS
HENRY TIDY
O. L. V. DE WESSELOW

don, W1.

FIXATION OF SKIN GRAFTS

SIR,—The normal method by which a skin graft adheres to its bed and receives nourishment is by the exudation of plasma from the bed and its clotting. Along the fibrils of the clot histiocytes move and transform it into a thin layer of connective tissue with lymph spaces which nourish the overlying epithelium. The very complicated method of carrying out this natural process described by Clarke, Milne, and Dodd in your issue of April 21 is frequently quite unnecessary. How often such aid is required I hesitate to say as I have no large figures to offer. But if a granulating wound, such as they describe, be curetted, the base will be found to be newly-formed connective tissue. If pressure be applied to this all bleeding will cease and a surface dotted with the red specks of clotted vessels, exuding a clear plasma, will be left. Thin grafts pressed down on this surface adhere as though they had been stuck on with glue, as in fact they have by the clotted plasma. This phenomenon is very easy to demonstrate, as also the fact that anchoring sutures are quite unnecessary. Patience in getting a bloodless bed, and patience in holding the graft down until clotting has occurred, eliminate the need for such complicated methods of fixation.

St. Mary's Hospital, W2. CHARLES PANNETT.

PLEURAL EFFUSION IN ATYPICAL PNEUMONIA

SIR,—Lieut.-Colonel Turner's most interesting article in your issue of April 21, in which he describes 11 cases of pleural effusion complicating an attack of atypical pneumonia, not unnaturally sets my mind thinking furiously, as I have been responsible, during the past three years, for labelling as tuberculous pleural effusions some 700-odd cases at the pleural effusion unit at Queen Mary's Hospital (LCC), Sidcup. Unfortunately, having recently left the unit, I cannot review the case-papers and skiagrams of each case where the diagnosis of tuberculosis was not confirmed bacteriologically, by the development of tuberculous lesions in the lungs or elsewhere, or by a strong family or contact history: and it is well known that the certain diagnosis of tuberculous pleural effusion can be made in only a minority of the cases, while in the majority it is only presumptive.

While Lieut.-Colonel Turner's paper strongly emphasises the importance of bearing in mind atypical pneumonia as a possible ætiological agent in cases of sterile lymphocytic pleural effusion, I believe a note of caution should be sounded at the earliest possible moment, lest this diagnosis become "fashionable." The cases described call also for some comment. It is not in any way unusual to find X-ray appearances of "consolidation" at the bases and in the mid-zones in well-defined cases of tuberculous pleural effusion: it would be tragic if all cases showing this X-ray appearance, and presenting a normal white-cell count and negative bacteriological findings, were ipso facto labelled atypical pneumonia. Skiagrams are not often taken, in civilian life at least, in the very early stages of acute pleural effusions, but I have seen films taken on the second and third day which all show parenchymatous shadows, and it is my belief that the lung, possibly only through an allergic flare-up, is always affected in some degree at the onset of an acute pleural effusion. Occasionally these basal shadows have persisted after the effusion has cleared up and a phrenic crush has been performed to control the lesion.

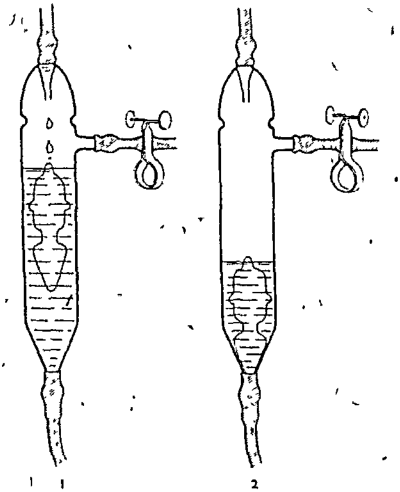
Of the 4 cases described by Lieut.-Colonel Turner in some detail, case 1 is interesting because of the slow recovery and the fairly prolonged delay in resolution of the effusion: this is very suggestive of a tuberculous process, but on the other hand a temperature of 105° F is extremely unusual in tuberculous effusions, and so is blood-stained mucoid sputum. I have no comments on case 2, except that what does "normal recovery" mean? Case 3 also shows some delay in absorption of fluid and it is interesting to note that some basal pleural thickening remained. Case 4 appears to me to fulfil more strictly the criteria for a diagnosis of atypical pneumonia, with pleural effusion, but even here I would have been comforted by an explicit statement that on the 36th day the chest was clear *radiologically* and by a more exact definition of "normal convalescence."

Because of the high interest of the matter, may I make a plea, through your columns, that Lieut.-Colonel
Turner and may come across
similar case greatest possible
detail and the skiagrams?
It would als to have a follow-
up of these cases. I have vividly in mind the case of a girl, aged 16, who was diagnosed as having atypical pneumonia by a chest physician at a London teaching hospital: four months later she developed a pleural effusion from which tubercle bacilli were grown, and a cavity was found in the region where the pulmonary lesion had been found four months before.

Sidcup. E. MONTUSCHI.

FATAL AIR-EMBOLISM DURING BLOOD TRANSFUSION

SIR,—The case of fatal air-embolism during a blood-transfusion reported in your issue of April 28 (p. 531) would not have occurred had the drip-feed here illustrated, which was described by Macintosh and Pask four years ago (*Lancet*, 1941, ii, 10), been used.



As long as fluid enters the drip-feed chamber the glass float remains on the surface of the liquid (fig. 1). If air instead of liquid enters the chamber, the float falls on to its seating and prevents the passage of air (fig. 2).

Nuffield Dept. of Anæsthetics,
Radcliffe Infirmary, Oxford. WILLIAM W. MUSHIN.

THE HORMONE CARTEL

pril 21 is timely in its
in interests attempting
It may interest your
of Schering products
steps were tak
early as 1911,
Ltd.—formed
Board of Trade, took over all the formerly German-owned Schering interests in this country. These interests include complete ownership of trade-marks and all rights to operate German-held British patents covering processes of manufacture.

Today, with a few minor exceptions, all former
German Schering
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to revert in any

185-190, High Holborn,
London, WC1. E. P. CARTER,
Chairman, British Schering Ltd.

ORDER AND DISORDER IN THE LARGE INTESTINE

SIR,—In his first Croonian lecture, reported in your issue of April 28, Dr. Hardy refers to the uncertainty of the vagus distribution to the colon. In a patient I saw some years ago, a tumour of the left carotid body had set up obstinate constipation as well as syncopal attacks. Presumably these effects were in part mediated by the efferent vagal fibres, activated from the carotid receptors, although there is some difficulty in excluding the concept of direct vagal stimulation. A barium meal showed rapid transit as far as the midpoint of the transverse colon. The meal was held up here for several days.

At operation, performed by a competent surgeon, the vagus was incidentally divided. The left vocal cord was later found to have been paralysed. The two symptoms—syncope and intractable constipation—were relieved.

In this particular case, the X-ray findings suggested that the vagus had a colonic "sphere of influence" which extended as far as the midpoint of the transverse colon.

Wimpole Street, W1. H. A. DUNLOP.

STRESS FRACTURES

thus bearing out in striking manner the accuracy of my observation that "fatigue fractures are essentially ("in an important degree": Nuttall's Dictionary) *incomplete.*"

Manchester. J. BLAIR HARTLEY.

HERPETIC ULCER OF CORNEA

SIR,—In an annotation of April 14 you say that "herpetic ulcers of the cornea may arise after high pyrexia from whatever cause, but especially after pneumonia, malaria, and influenza. . . ." I have worked in Malaya, and, during the war, in Egypt and India, for a total period of 19 years. During this time I have had many thousands of cases of malaria through my hands, but I have only seen one case of herpetic ulcer occurring during an attack of malaria. I did, however, meet an ophthalmic surgeon in India, with previous experience in East Africa, who stated that he regarded it as a common complication. It would be interesting to learn in what parts of the world this is indeed a common complication of malaria; for, surely, it is not a condition to which the patient would not draw one's attention.

London, SW1. BERNARD DAY.

* * *

ASSOCIATION OF SURGEONS OF GREAT BRITAIN AND IRELAND

DURING the annual meeting on May 2 and 3 the annual dinner was held at the Connaught Rooms. Sir Alfred Webb-Johnson, PRCS, proposing the health of the association, said
ly to establish the criteria
of surgical specialist; it
geons to adopt a uniform
president (Surgeon Rear-
red described him as one
of the greatest and boldest of British surgeons today—a man who had risen high because his foundations were deep. In his reply Admiral Gordon-Taylor passed in review some of the giants of former days—Lister; Hunter, Watson-Cheyne, StClair Thomson; Moynihan; Rutherford Morison; Larrey; Pirogov; Travers, Dupuytren; Woodall Lind, Trotter, and Gilbert Blane, and those other naval surgeons Huxley, Darwin, and Hooker, Syme, Liston Astley Cooper, Charles Bell; George Makins, Bowlby Percy Sargent; Bland Sutton; David Wilkie; and many more—each pictured in a few evocative words. The men of progress, he said, are those with a respect for the past. As for the future, he quoted the poem quoted by the Prime Minister—"But westward, look, the land is bright."

Obituary

SIR CHARLES MACWATT

KT. CIE, M B, B SC EDIN., FRCS FRCPE

Major-General Sir Charles Macwatt, director-general of the Indian Medical Service from 1922 till his retirement in 1926, died at Kingston Hill on April 14 at the age of 80. His father, another Robert Charles Macwatt, who was in practice in the Berwickshire village of Duns, sent him to the Royal High School and the University of Edinburgh. Macwatt graduated MB in 1886, and in the following year was already a captain in the IMS. During the next years he served with distinction in the campaigns on the north-western and north-eastern frontiers of India. He lost no opportunity for continuing his medical studies, taking his B Sc in public health in 1897 and his FRCS in 1911. He was elected FRCPE in 1925.

Few men inspired greater confidence in the minds of those in a position to judge their work. He was conspicuously lacking in the arts of self-advertisement and showmanship, but his sound judgment, ability, and honesty were recognised by his selection for a succession of responsible posts. As chief medical officer of Rajputana, and ADMS and inspector-general of the civil hospitals of the Punjab, he won the friendship of the ruling princes and was their trusted adviser not only in his professional capacity but also on many other important matters connected with their States. After his retirement he returned to Bikanir again and again as the counsellor of its enlightened ruler. As director-general Macwatt showed the same qualities of head and heart. He was a shrewd judge of the character and abilities of his officers, who respected him all the more for his unassuming and friendly manner. He never hesitated to consult any of his subordinates on matters of which they had special knowledge, and his methods were always those of a democratic leader rather than of a dictator. The affectionate admiration in which he was held by those who knew him well was striking; for example, one of them who was facing personal sacrifices in educating his son remarked that he was doing so "in the hope the boy may grow up to be a man like Sir Charles Macwatt."

His first wife, Miss Blanche Blyth, by whom he had two sons, died in 1924, and last year he married the widow of Lieut.-Colonel R. C. Wilson.

ROBERT LAWFORD KNAGGS

M D, M CHIR CAMB., F R C S

Lawford Knaggs, who came of a Huddersfield family, was for many years surgeon to the General Infirmary at Leeds, and was professor of surgery in the University of Leeds from 1910 to 1919. After his retirement he did valuable work in the museum of the Royal College of Surgeons and in 1926 produced his treatise on the *Inflammatory and Toxic Diseases of Bone.* He died on April 16 at his home at Newton Abbot.

Educated at Cambridge and Guy's Hospital, Knaggs qualified in 1883 and was resident obstetric physician at Guy's before going to Leeds. At the General Infirmary he soon became known as a capable, careful, and conscientious surgeon. Cautious and slow, he set himself a high standard, and had exceptionally wide knowledge. A former student, recalling that he preceded Moynihan on the staff and was a contemporary of Mayo-Robson, Ward, and Littlewood, writes:

> If "irascible" is the word to apply to the surgery of Mayo-Robson; if the operating-theatre of Edward Ward had something of the wit and humour of a brain's trust; if the energies of Harry Littlewood recall the despairing but invincible battering of Dutchmen at their dykes—perhaps Mr. Lawford Knaggs suggested most the doughty foot soldier of surgery, with a touch of cavalier stubbornness in his attacks. In some ways he may be regarded as almost the last of the general surgeons of Leeds, and even to his later days the unexpected width of his professional knowledge enabled him to deal, for example, with ophthalmic cases.

As a surgeon pathologist who did much for the [illegible] of the Leeds school, he was a pioneer in several [illegible]ions: in 1910 for example he reported some early [illegible] on transplantation of the ureters which he approached successfully by a posterior route. Like his colleagues he did a great deal of abdominal surgery. But, latterly at any rate, his chief interest was in bones, and he may be said to have laid the foundation of the orthopædic department of his hospital.

His output of [illegible] was large, and they reflected hi[illegible] and judgment. Deliberate in conversation, he lectured in a [illegible] commanded attention. In [illegible] striking, and he was on the [illegible] As a member of a hospital [illegible] a steadiness of character, a[illegible] which made him generally respected. Throughout the last war he carried on, without a break, the double duties of a full hospital surgeon and of a Territorial surgeon at the 2nd Northern General Hospital. The regularity and persistence of effort [illegible]'s health and strength was paralle[illegible] interest in the diseases with which he had to grapple.

The former student to whom we are indebted for some of these notes adds:

> Finally I would like to mention one remarkable case in which I assisted with him and which I do not think he ever recorded. After laparotomy had revealed an extensive carcinoma of the stomach spreading over the greater curvature—making I think even a gastro-enterostomy impossible—the patient developed a gastric fistula and the margins of the opening became invaded with the cancerous growth.
>
> Yet after a few weeks this fistula closed. This unbelievable occurrence gives one such a vivid realisation of the almost unsuspected rises and falls of the tide of cancer as perhaps to give continued hope and heart to the efforts of the profession to the alleviation of this ill. I somehow feel that Mr. Lawford Knaggs would attach more value to a note of this sort than a panegyric on his victories.

In 1930 Lawford Knaggs was awarded the gold medal of the Royal College of Surgeons in recognition of his work for the Hunterian Museum, which included the cataloguing of the Strangeways collection of specimens illustrating arthritis.

HENRY EDWARD ANNETT

MBE, M D VICT., D P H

Dr. Annett, whose death in Birkenhead is announced, graduated with honours in the Victoria University of Manchester in 1894. He was the first salaried member of the professional staff of the Liverpool School of Tropical Medicine, being appointed demonstrator in tropical pathology in February, 1899. In the same year he went with Ronald Ross, and E. E. Austin of the British Museum, on the first malaria expedition of the school, to Sierra Leone, West Africa, and in 1900 he himself took charge of the school's third malarial expedition, to Nigeria. Later he became professor of comparative pathology in the University of Liverpool, but from 1905 to 1911 he continued to act as honorary lecturer in the School of Tropical Medicine. From 1922 to 1926 he was a member of the staff of the Liverpool Cancer Research, and from 1930 to 1936 was Turner research fellow in cancer. His numerous papers on malaria, filariasis, and other diseases prevalent in West Africa were mainly published in the memoirs of the expeditions of the Liverpool school.

WALTER PHILLIPS

MBRUI, FRCS

THE profession in Derbyshire loses a distinguished member in Dr. Phillips of Matlock who died on April 19.

He was born in Damascus in 1878, the son of the Rev. John Phillips of the Irish Presbyterian Mission, and it was natural that these early influences should have a profound bearing on his later career. On the return of his parents to Belfast, he entered the Royal Academical Institution there and later Trent College. Thence he passed on to Queen's College, Belfast, completing his medical training at the Middlesex and London Hospitals and qualifying in 1902. After holding various house-appointments at the Belfast Royal Victoria and London Hospitals, he followed in his father's footsteps to become a medical missionary of the same Church, and so commenced an arduous career in China. His period of service in that country was only interrupted by his return to England in 1912 to take his surgical fellowship. On his return to the East he became surgeon to the general hospital at Newchang and also port medical officer. His steady conscientious work did not pass unnoticed and for his services during various plague epidemics he was honoured by the Chinese government. On the outbreak of the Japanese "incident" in North China, he returned home, and thenceforward carried on a busy general practice.

Shy and reserved, Dr. Phillips was not easy to know; but once one had penetrated this barrier one found a [illegible]

but he had literary talents of no mean order, and he wrote several short stories and novels which were much enjoyed by a small circle of friends though he would not allow them to be published. He was an excellent conversationalist and his travels had made him a brilliant linguist. He was fond of a game of chess, and his other hobbies included carpentry and the serious study of Nature on the quiet lonely moors near his home. He married, in 1902, Irene, daughter of John Dickson, British consul-general at Jerusalem, and she survives him with a son in the Indian Medical Service and a daughter in the WAAF.

W. H. M.

THE LATE SIR HUBERT BOND

C. J. T. writes: I knew Sir Hubert Bond as an official of the Board of Control and a friend for a quarter of a century. First and foremost I picture him as an enthusiast who worked with tireless energy during the whole of his long professional life for the advancement of psychological medicine. He strove for more adequate teaching of his specialty in the medical curriculum, for early treatment without certification, for the transformation of the old "asylums" into hospitals, and for organised research grouped round the large universities and teaching centres. He lived to see his views receive general acceptance and many of them put into practical effect.

He was the kindliest of men. How many medical superintendents (including myself) there are who received their first encouragement as junior AMOs from this senior government official.—"Would you like to make accurate observations on a new drug for me?"—and we felt very proud to be singled out for the task.

The humblest of patients would receive a sympathetic hearing from him. I remember a visit to a large mental hospital when at the end of a long and tiring day's inspection a conveyance arrived to take him to the station and he suddenly realised that he had promised a personal interview to a patient. I offered to explain the position to the patient, but Bond replied "I could not very well break my word," [illegible] He had an [illegible] of giving [illegible]. He was a great believer in the use of the telephone. Most of my letters to him were unanswered, but sooner or later the telephone would ring and I would hear "This is Bond speaking" from Blackpool, Birmingham, or wherever it might be. "How nice to hear your voice. This is nearly as good as a personal interview and will save me a letter."

There was a strong sentimental side to his character. He had, of course, an encyc [illegible]

was most touching, and he would come from the other side of England at a moment's notice if their interests were affected. Things beautiful or old had a great attraction for him. He was in his element when discussing trees, flowers, and ward gardens, and delighted in his leisure moments to visit old churches and places of architectural beauty about which his knowledge was extensive.

Among his many appointments was that of consultant in neurology and mental disorders to the Royal Navy. I have a vivid picture of the slim figure with the bowler hat being given a ceremonial send-off in the pinnace following an official visit to the Royal Navy Hospital, Haslar, and his obvious [illegible] "Trust the Royal Navy to [illegible]

[illegible] ries of Sir Hubert is at the [illegible] ings of the Royal Medico-Psychological Association which he served so well. It seemed as though everyone wanted "a word with Sir Hubert" to get his blessing or advice on some projected scheme, and teacup in hand we edged towards him to take our turn.

His visits to my home were memorable occasions—greetings to his hostess accompanied by a posy of flowers, gifts of sweets or money to the children, delight at the trout caught specially for him, and afterwards reminiscences lasting to the early hours of the morning. Fresh as a daisy he would catch an early morning train to do a day's work which would exhaust many a younger man. He took his leave with old-world courtesy, and his own parting words, "Goodbye and a thousand thanks," would be a fitting farewell from us to him.

MAJOR G. L. ALLEN

[illegible] with great reluctance.

Having enlisted in the Army at 17, Allen was later commissioned in the RAMC as a lieutenant (quartermaster). He saw service in almost all parts of the world and retired in 1912, but during the last war he was recalled and he finally retired in 1918 with the rank of major. In 1913 he had been appointed assistant registrar of the School of Physic, and in [illegible] showed no trace of tremor. His urbanity was seldom ruffled, and his courtesy and willingness to help were extended to all who entered his office.

Births, Marriages, and Deaths

BIRTHS

CONYERS.—On April 29, at York, the wife of Mr. J. H. Conyers, FRCS—a son.

[illegible]

MUL[illegible] of Lieut. Andrej Muller, [illegible]

WA[illegible] of Surgeon Lieutenant Richard Wadia, RNVR—a daughter.

WHARTON.—On April 29, at Kidderminster, the wife of Dr. Christopher Wharton, of Kineton, Warwickshire—a daughter.

MARRIAGES

[illegible]

DEATHS

DAVIES.—On April 29, at Trewillian Road, Brockley, SE4, John Stanley Davi[illegible]

[illegible] at Grinstead, George Algernon [illegible] formerly of Cramond Bridge, [illegible]

[illegible] Holman, MD DUBL., of Horsell, Woking, aged 81.

LAWRENCE-SMITH.—On April 28, at Waterlooville, Hants, James Lawrence-Smith, CB, MVO, MB ABERD., surgeon rear-admiral RN retd., aged 82.

MACMILLAN.—On May 2, in Edinburgh, Robert James Alan Macmillan, DSO, MB EDIN.

MACNAMARA.—On April 28, at Shrivenham, Albert Persse Macnamara, MB DUBL., aged 72.

MUTCH.—On May 1, Michael William Lane Mutch, MA, MD.

Notes and News

WAYS AND MEANS IN PSYCHIATRY

PSYCHIATRIC treatment is usually long and costly; but two annual reports remind us that keen workers can provide it at relatively little expense; and that good facilities make it possible to shorten the time of treatment. The Liverpool Psychiatric Clinic, which has been in action since 1924, has still to protest its urgent need of an adequate psychiatric social service and proper secretarial assistance.[1] Yet in each of the past three years the clinic, with its tiny balance-sheet of less than £350, has accepted 259–260 new outpatients, and in 1944 it was able to increase the number of attendances from 830 to 922. With adequate funds and more staff the medical directors believe the clinic could meet the increasing demands for its services which come from doctors, public authorities, and social organisations. During the year its staff have helped many invalided members of the Services to adjust themselves to civilian life, and have continued to take a keen interest in the problems created by war for children and young people.

A contrast in opportunity is offered by the York clinic at Guy's Hospital, of which the first annual report has just appeared. As the first British psychiatric inpatient clinic housed in a general hospital, its facilities for treatment have been exceptional and its experience unique. During the 9 months which had passed when the report was written 168 patients had passed through the clinic, and it was expected that numbers would exceed 220 by the end of the year. About two-thirds of the admissions have been EMS patients recommended by Service psychiatrists; the remaining third were nearly all private patients, but a few non-paying patients from the general wards of Guy's were accepted, and it is hoped to extend this service. The clinic maintains only 43 beds, but thanks to the wide choice of methods available and good standards of staffing, the turnover has been rapid, the average stay for Service patients being 43 days and for private patients 44. Conditions treated have included all the common neuroses and psychoneurosis, with anxiety state heading the list and combat exhaustion coming a good second. Most of the combat exhaustion cases recovered in 21–28 days, and only one had to be boarded out of the Service, though some had to be discharged in lower medical categories. It is noteworthy that the civilians have usually been suffering from more severe degrees of psychological abnormality than the Service patients. Methods of treatment include electric convulsive therapy, insulin therapy, continuous narcosis, hydrotherapy, vitamins, psychotherapy, social activity, and occupational therapy. Some patients, towards the end of their stay, have been able to go to work during the day-time, returning to the security of the clinic at night—an arrangement which recalls the night sanatoriums of Russia.

University of Cambridge

The title of the degree of MD has been conferred on Mrs. Mavis Gunther.

University of Edinburgh

On Friday, June 8, at 5 PM, at University New Buildings, Teviot Place, Edinburgh, Prof. E. B. Verney, FRS, will deliver the sixth Sharpey Schafer lecture on the absorption and excretion of water and the antidiuretic hormone.

Royal College of Physicians of Edinburgh

At a meeting held on May 1, with Dr. A. Fergus Hewat, the president, in the chair, Dr. James Ronald (Stirling) took his seat as a fellow. Dr. Cyril Hocken Tewsley, CMG (Auckland, NZ), Dr. Munir El Gazayerli (Alexandria), Dr. Bryce Ramsay Nisbet (Kilmarnock), Dr. Albert Arthur Huse (Birmingham), and Dr. Ronald Haxton Girdwood (Edinburgh) were elected to the fellowship. Prof. J. A. Nixon (Bristol) was appointed Dr. Alexander Black lecturer for 1945.

British Institute of Radiology

On Thursday, May 17, at 7.30 PM, at 32, Welbeck Street, London, W1, Dr. E. Rohan Williams will deliver his presidential address on the planning of the diagnostic radiological department in a large general or teaching hospital. On the following day, at 4 PM, Dr. J. F. Brailsford will read a paper on malignant disease of bone.

University of Dublin

Prof. B. A. McSwiney, FRS, will deliver the fourteenth John Mallet Purser lecture at the School of Physic, Trinity College, on Wednesday, May 16, at 4.30 PM. He is to speak on visceral sensation.

Medical Society of London

On Monday, May 14, at 5.15 PM, at 11, Chandos Street, W1, Dr. F. M. R. Walshe will deliver the annual oration. He has chosen as his subject the integration of medicine.

Royal Society of Tropical Medicine and Hygiene

At a meeting to be held at 26, Portland Place, London, W1, on Thursday, May 17, at 3 PM, Colonel H. E. Shortt, IMS, will speak on the transmission of kala-azar in India.

Royal Society of Medicine

On Wednesday, May 16, the section of physical medicine is holding a meeting at 2 PM at the RAF Physical Training School, Loughborough, Leics. At the section of obstetrics and gynæcology at 5 PM, on May 18, Mr. A. F. Clift will speak on the rheological properties of cervical secretion and Mr. Malcolm Donaldson on carcinoma of the cervix uteri. The section of radiology will meet at 6.30 PM on the same day when Dr. J. F. Brailsford will read a paper on the latent phase between onset and radiographic signs.

Building Research Committee

The scientific advisory committee on building appointed by the Minister of Works includes Prof. J. M. Mackintosh, FRCP, and Prof. S. Zuckerman, MD, FRS. Lord Amulree, MRCP, and Dr. R. S. F. Schilling are among those appointed as assessors.

Children's Ward as War Memorial

A children's ward in the country is planned for St. Thomas's Hospital as a memorial to children killed by enemy action in London. A special appeal for funds is being made and a gala performance of *A Night in Venice* is to be given in aid of the project at the Cambridge Theatre on June 4. at 6.30 PM.

Parliamentary Candidates

Lieut.-Colonel Leonard Browne, RAMC, has been adopted as Labour candidate for the Penrith and Cockermouth division of Cumberland, and Squadron-Leader Samuel Segal, MRCS, RAFVR, as Labour candidate for Preston.

A Prisoner of Buchenwald

In the *Times* of May 2 the death is announced last spring, at Buchenwald, of Dr. George Rodocanachi, of Marseilles, "after 2 years' imprisonment for his assistance to the Allied cause, and for having, with his wife . . . sheltered over 190 allied airmen."

Lectures for Doctors at Birmingham

The British Council has arranged the following lectures, for doctors of the Dominions and US Forces and members of the British Medical Association, in Birmingham on Sundays at 7.30 PM at the University Overseas Club: Dr. T. L. Hardy, peptic ulcer (May 13); Mr. Hugh Donovan, cancer (June 3); and Prof. A. C. Frazer, fat embolism (June 17).

London Association of Medical Women's Federation

At a meeting to be held on Wednesday, May 16, at 8 PM, at BMA House, Tavistock Square, WC1, Lieut.-Colonel Albertine Winner, RAMC, will speak on Social Medicine and the Women's Services in the Armies of Britain, Canada, and the USA.

Mr. H. S. SOUTTAR has been elected a manager of the Royal Institution.

Appointments

ALLISON, D. R., MD LEEDS, MRCP: physician to the Manchester Northern Hospital.

CAMPBELL, JOHN, MB GLASG.: factory surgeon for Dreghorn, Ayrshire.

FERREIRA, JOAN, MRCS: temp. asst. MOH for Swansea.

GREEN, G. W., MB LEEDS, DPM: asst. MO in the York Clinic, Guy's Hospital, London.

HARRIES, C. W., MB LPOOL: temp. asst. MOH for Walsall.

ROSENTHAL, RUDI, MD PRAGUE: RSO at the Coventry and Warwickshire Hospital.

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[1] Annual Report, 1944. Obtainable from the Secretary, 1, Aberby Square, Liverpool, 7.

SURGERY OF PERSISTENT DUCTUS ARTERIOSUS

T. Holmes Sellors, DM, MCH OXFD, FRCS
SURGEON TO THE LONDON CHEST HOSPITAL AND THE EMS THORACIC SURGICAL UNIT, HAREFIELD

For some years tentative suggestions had been put forward that a patent ductus arteriosus could be occluded by surgery, but it was not until 1939 that Gross and Hubbard published the first successful case. Since then a number of surgical attacks have been delivered, with considerable success in the cases that have been recorded.

The incidence of patent or persistent ductus arteriosus can best be judged from Maude Abbott's classical studies on congenital heart disease (1937). Out of 1000 autopsy specimens investigated, patency unassociated with any other heart defect was observed in 92 instances. A further 150 cases were associated with some other cardiac abnormality and it is important to note that the ductus may have a compensatory rôle in some cases of this group. For example, in coarctation of the aorta or extreme aortic stenosis, and in cases in which the right ventricle and pulmonary artery have a defective communication, circulatory efficiency is only obtained by passage of blood through the ductus or through a patent interventricular septum. If there is no opening in the septum the ductus has to serve as the channel through which blood can reach the lungs. Closure of this fistula would result in disaster.

Surgery can only be concerned with those cases of patency in which the occlusion would not bring about any detriment to the circulatory system. Surgery can however provide great benefit to patients who are suffering from ill effects attributable to the abnormality and it must be decided what circumstances and complications constitute an indication for interference.

INDICATIONS FOR SURGERY

A persistent ductus is an arteriovenous fistula through which the pulmonary and systemic circulations can come in contact. The direction of any blood-stream through the ductus is from the high pressure of the aorta into the lower t
cula-
tion, with the result tl
occur
make their maximum
side
of the fistula. Extensive dilatation of the pulmonary conus develops and the main pulmonary trunks with the whole of the vascular bed of the lungs become enlarged. If there is any circulatory disability it will depend on the proportion of the systemic blood that is "shunted" through the ductus. Heart-failure does account for death in a proportion of cases, but this is not the main complication to be feared. Infection in the form of subacute bacterial endocarditis with *Streptococcus viridans* as the causative organism accounts for a high percentage of deaths. Abbott gives the figure as 37·5% of those uncomplicated cases who have survived the first five years of life.

In this form of endocarditis the vegetations that form well on the pulmonary side of the ductus are liable to be broken up by the swirl and tumult of blood and form emboli which are principally carried into the lungs. Extension of the infection on the aortic or other valves inevitably gives a bad prognosis, but in the early stages as long as the infection is localised ligature of the ductus offers one of the most dramatic cures that surgery knows. Heavily positive blood-cultures can become sterile within a very short time of the duct being tied off, and the patient be restored to normal from a hopeless position. It is not, however, necessary to await a positive blood-culture in order to establish the diagnosis of infection. In the majority of cases preliminary administration of sulphonamides has failed to control the condition. Among the cases published by Tubbs (1941) and by Touroff (1942) there are examples which have shown that simple ligature is adequate; but in most cases a combination of chemotherapy and ligature has been used. In this class of case I have operated without misadventure on four occasions. Three of the patients can be regarded as complete cures: the fourth took several months before the temperature returned to normal, though clinical improvement was satisfactory.

The mechanism by which occlusion of the patent ductus cures subacute bacterial endocarditis is by no means certain. Since vegetations lie on the pulmonary side of the ductus they may possibly form in zones of "dead-water" produced by the eddies of the blood in the pulmonary conus. At operation we have studied in all cases the degree of the swirl and tumult in the conus, and also confirmed that the thrill is most obvious at an area on the conus about 1¼ to 1½ inches below the ductus and *not over the ductus itself*. When the ductus is obstructed the whole disturbance disappears and the pulmonary and systemic circulations pursue their normal courses. The areas on which the vegetations are lodged are swept over by the moving current of blood, and it is possible that the normal bactericidal effect of blood may help the resolution. Touroff has suggested that loosely attached fragments may be carried on into the lung tissue which can deal effectively with these infected particles. In any case nothing can get into the aorta from the pulmonary vessels, and blood-cultures which have previously been positive become negative.

Subacute endocarditis which occurs in the presence of a patent ductus is a definite indication for early surgery, and thi-
there is any
failure of respon
long-standing
infection, where
nded beyond
the pulmonary area, the chances of cure are reduced, but ligature accompanied by chemotherapy may lead
en after the interval of a
Early operation in all cases

es of persistent ductus can survive into middle or old age without much inconvenience, but the average expectation of life is 20–25 years. Where the ductus persists into adult life there is considerable enlargement of both ventricles, and calcification of the actual fistula is common. This latter change may be contributory to an aneurysmal condition of the ductus arteriosus. Abbott (1937) had 13 cases of this aneurysm associated with other defects in her series, and Mackler and Evarts Graham (1943) discuss 3 cases of their own. Out of a collected total of 29 cases, 21 were found to have occurred in children, so that it is possible that some inherent weakness in the ductus wall (excessive muscle and too little elastic tissue) contributes to the causation in youth before degenerative changes have time to set in.

When there is a large functional "shunt" there will probably come a time when compensation fails and symptoms appear. Dyspnœa on exertion and an obviously turbulent heart may be associated with cyanosis in some cases. Tachycardia and exaggerated pulsation, which may be severe enough to shake the whole body, are conditions which demand the consideration of surgery. The arteriovenous fistula can be closed to allow complete restoration to normal, assuming that the patent ductus is the sole lesion. I have operated successfully on 3 cases in this category.

The final question to decide is whether it is justifiable to advocate ligature in a symptomless case. The reasons for surgery are la
group: closure of the duct
prevent the occurrence of
Against this must be balanced the risk of operation. The time elapsed since operation is as yet too short to decide if any unexpected benefit has been gained, but we have gained the impression that children so treated have become more robust and have grown more than would have been expected on their previous rate of progress. Three cases have been operated on in this category without incident. It seems reasonable to suppose that the ventricles will be saved the continuous strain otherwise imposed on them, but as has already been stated there must be virtual certainty that the heart has no other abnormality and that circulatory function does not depend on the persistence of the ductus.

ÆTIOLOGY OF PERSISTENT PATENCY

The reason for continued patency of the [illegible] arteriosus is a matter for conjecture. [illegible] colleagues (1930) have demonstrated the [illegible] closure in some mammals after birth, but observations on the human subject are lacking. It is presumed that the process of obliteration is fairly rapid in human beings, though autopsies on children suggest that this may be functional rather than mechanical over several months. The musculature of the ductus increases during the later stages of fœtal life and it is possible that contracture of these fibres helps to convert a tube into the "ligamentous" structure normally found in the adult. However the main problem is to find out why a sudden flow from the pulmonary artery through the ductus into the aorta is directed into the normal postnatal channels. The opening of the pulmonary vascular bed undoubtedly plays some part in altering the pressures on either side of the ductus. The intrathoracic "negative" pressure occurring with the first breath of life, sudden changes in aortic and pulmonary pressures and temporary lowering of the systemic tension when the placental circulation has been excluded have been advanced as possible reasons for the closure. There is another factor which should be considered and that is the anatomical relations of the ductus with the aortic arch. If the ductus is placed so that the angle formed between it and the aortic arch is acute the flush of blood through the aorta tends to sweep past the ductus opening. If, on the other hand, the ductus lies less acutely the rush of blood may impinge on the mouth of the ductus and maintain its opening. This view is difficult to confirm from anatomical study, since dissection is liable to disturb the relationships which would have to be accurately studied in an assessment of angles. We have endeavoured to determine this point at operation and autopsy but without any striking success.

SURGICAL TECHNIQUE OF CLOSURE

The surgical approach to the ductus can be made through a left anterior thoracotomy with the incision in the second interspace. The enlarged pulmonary conus bulges out well into the field of the operation and slightly obscures the deeper aspects of the mediastinum. Once lung has collapsed or has been freed from the mediastinum the arch of the aorta is identified and the left pulmonary artery located as the highest and most anterior structure in the lung hilum. On this vessel, as it emerges from the mediastinum, is a gland of variable size—the gland of the ductus arteriosus—and at this point an opening is made into the loose tissues. The dissection is then extended up towards the under surface of the aortic arch and the vagus nerve should be identified as it lies on this great vessel. From the vagus, and curving deeply round the arch, is the recurrent laryngeal nerve which marks the posterior limit of the ductus. Anteriorly the exposure should be limited by the phrenic nerve, which is readily recognised and may be retracted forwards if necessary.

In our experience the size of the ductus has been fairly constant; shorter perhaps than might be expected (⅓ to ¼ inch) and of formidable width (½ inch or more in diameter). Contrary to what is sometimes said the size of the ductus does not have any relation to the extent and sound of the thrill or murmur. These latter are more readily altered by disturbing the angle at which the ductus lies with gentle pressure than by moderate degrees of constriction.

The exposure of the deep aspect of the ductus constitutes the most difficult part of the operation, since the thin walls can easily be distorted or pinched together and rendered vulnerable to puncture or tear. By working very carefully with the little finger or curved blunt dissecting forceps the whole circumference of the vessel can be freed. The actual ligature is made with a double strand of thick silk or thread, tightened carefully and firmly, but not so tightly as to run the risk of cutting through the flimsy walls. The principles laid down by Ballance (1891) regarding the ligature of large blood-vessels in continuity should always be remembered, and the "stay-knot" advocated by him seems to be the most satisfactory form of obliteration. Division of the ductus between ligatures is a hazardous and unnecessary undertaking, though injury to the vessel walls may make this course advisable. In passing ligatures care must be taken to avoid inclusion of the recurrent laryngeal nerve and the efficacy of the ductal closure can be confirmed by observing the complete cessation of the thrill. It should [illegible] the space afforded for dissection and [illegible] is limited and difficult of access in most cases. The operation is completed by loosely closing the mediastinal pleura and by suture of the chest wall with removal of air.

CASE-REPORTS

Infected cases.

CASE 1.—Girl, aged 15, [illegible] uctus had been made at the age [illegible] mised by sudden onset of high [illegible] ain in [illegible] later [illegible] grew [illegible] *ans.* X-ray examination showed an enlarged pulmonary conus and increased vascular lung markings, plus a collapsed left lower lobe and abnormal shadows throughout the lung parenchyma suggestive of infarcts.

The ductus was tied off two months after the onset of the illness. The thrill and murmur disappeared immediately, and blood-cultures from the next day onwards were negative. The continued high pyrexia improved rapidly and the temperature was normal at the end of the week. Culture of the gland of the ductus arteriosus excised at operation was sterile. Complete recovery resulted and the patient three years after operation can undertake normal activities. The lower lobe of the left lung now appears normal.

CASE 2.—Man, aged 38, with no previous recognition of any heart lesion. Hæmoptysis and pleurisy followed dental extraction and was accompanied by high fever, rigors, and loss of weight. Radiology showed an enlarged pulmonary conus and shadows in the lung fields suggestive of emboli. There was no characteristic thrill and only a faint murmur in the pulmonary region. The pulse was of the water-hammer type. Blood-culture was negative, and there was no response to a course of sulphapyridine.

Ligation of the ductus changed the blood-pressure from 128/40 to 124/70 mm. Hg, and the temperature returned to normal within 12 days. Recovery was complete.

CASE 3.—Boy, aged 17. Patent ductus diagnosed at age of 10 years. Sudden onset of high fever with pain in the chest and slight hæmoptysis accompanied by a blood-culture which grew *Strept. viridans.* The character of the murmur was said to have altered slightly at this time.

Ligature of the ductus was followed by a slow return to normal with temperature becoming steady after 3½ weeks. Later recovery was complete, though a faint apical systolic murmur persisted for some months.

CASE 4.—Woman, aged 33, who was known to have had a weak heart since childhood. Bilateral renal calculi developed and had required several operations ending in a left nephrectomy. Endocarditis was suggested by more recent fever with hæmoptysis and pain in the chest. Temperature ranged between 100° and 103° F; blood-cultures were indefinite.

Occlusion of the ductus abolished the typical murmur and thrill and changed the blood-pressure from 140/65 to 160/85 mm. Hg. Ultimate recovery was satisfactory, though a low-grade fever (99–99·5° F) persisted, possibly because of low-grade renal infection.

In the above cases a course of sulphadiazine was started two or three days before operation and continued for a week or ten days. There was no particular operative incident and lung expansion was quickly regained.

Cases with signs of failure.

CASE 5.—Girl, aged 19, who was known to have congenital heart disease since infancy. There was some incapacity for exercise in childhood. Recent attacks of dizziness with palpitations and retrosternal discomfort were noted and the continuous noise in the chest was disturbing. Pulsation was very pronounced and shook the patient, and flushing was frequent. The typical thrill and murmur were unduly loud.

Ligature of the ductus altered the blood-pressure from 135/55 to 120/100 mm Hg, and signs and symptoms disappeared except for an apical systolic murmur.

CASE 6.—Boy, aged 10, who had been under medical observation since childhood, but in whom patency of the ductus was not recognised until the 4th year. The child was undersized, easily tired, and worried by the violence of the heart pulsations which were very obvious. There was increasing inability to take exercise, and tachycardia was well marked. Radiologically in addition to the enlarged pulmonary conus and vascular markings the transverse diameter of the heart was enlarged.

The ductus was tied with satisfactory result. Blood-pressure rose from 90/40 to 130/84 mm. Hg. Later improvement was maintained, though some degree of tachycardia persisted.

CASE 7.—Girl, aged 6 years, in whom a diagnosis of patent ductus was made in the first year of life. There was some recent tiredness and shortness of breath which had greatly increased. Pulsation had also become noticeable and was beginning to be troublesome.

On ligature of the ductus the blood-pressure changed from 110/30 to 110/60 mm. Hg, and the end-result was satisfactory.

Cases without symptoms.

CASES 8, 9, and 10.—In these small patients, whose ages were 6, 7, and 9 years, the classical signs of a persistent ductus arteriosus were well defined. There were no obvious symptoms and the capacity for exercise was reasonable.

Occlusion of the ductus by ligation was successfully obtained without any untoward event. During the limited period of follow-up available the children's physical development seems to have improved considerably.

SEQUELS OF OPERATION

Occasionally an apical systolic murmur persists, and this occurred in 3 personal cases in the series for a few weeks after operation. The exaggerated pulmonary vascular markings disappear slowly, as also does the enlarged pulmonary conus. Multiple fluffy patches produced by infarction in infected cases clear quite rapidly, and disappear within 2–3 weeks. Signs of turbulence or any vascular fistula are immediately reduced, but may not disappear completely for several months.

There have been recorded instances of recurrence of the typical patent ductus murmur and thrill, and this has usually resulted from the ligatures cutting through with re-establishment of the fistula through a false vascular channel. This suggests that the choice of ligature material and method of ligation have not been finally settled. In infected cases, persistence of fever or any suggestion of embolism is an indication for a full course of chemotherapy to deal with vegetations which have arisen in sites other than near the ductus.

SUMMARY

Patients with an uncomplicated patent ductus arteriosus run the risk of subacute bacterial endocarditis and heart-failure.

Ligature of this channel can provide striking relief in a high proportion of cases.

An absolute indication for ligature is early infection. It is also a reasonable procedure in cases which show signs o [illegible] re.

The [illegible] mptomless cases is more indefin [illegible] prophylactic procedure, but th [illegible] ot be ignored. Most of the cases are recognised early in life and a high proportion remain for years under observation. If anything untoward occurs it should be possible to consider surgery without delay.

Of 10 personal cases of ligature of the ductus all were successful and there were no complications.

Of the many colleagues to whom I am indebted for guidance and help in venturing into this branch of surgery, I would particularly like to mention Prof. G. W. Pickering, Dr. Lloyd Rusby, Dr. K. May, and Dr. Alan Moncrieff.

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EFFECTS OF ALCOHOL AND SODIUM AMYTAL ON INTELLIGENCE-TEST SCORE

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WHILE dealing with cases of acute neurosis following the Dunkirk evacuation and during the battle of Britain and the London blitz, we repeatedly observed the supreme importance of first-aid barbiturate sedation, given by mouth or intravenously, for men of good personality who had broken down or appeared liable to break down under the intense stresses of modern warfare. Since then we have repeatedly emphasised that sedation should be given at the earliest possible moment. Preferably it should be given in the front line, and within minutes or hours of the stress rather than days later when the patient has already collapsed and is back in safety (Sargant and Slater 1940, Debenham et al. 1941, Sargant 1942). By then "conditioning" processes may have set in, the chances of return to duty are minimised and permanent nervous sequelæ may result. Immediate sed [illegible] ous system is just as im [illegible] of a badly damaged or [illegible] it may prevent total breakdown or if breakdown occurs it minimises further aggravation. Repeated jarring of the nervous system unable to cope properly with environmental stimuli must be avoided at all costs. In the absence of normal sleep, prophylactic sedation may also give the nervous system a chance to maintain or re-establish itself, and enable the person to keep on fighting (Sargant 1942).

Reports of the first full-scale trial of "front-line" barbiturate sedation in the North African campaign confirmed these observations. In a circular (No. 176) on the early recognition and treatment of neuropsychiatric casualties, the medical department of the US Army advocated that "heavy sedation should be initiated when the patient is first seen," and that "the sedative of choice is sodium amytal" (*J. Amer. med. Ass.* 1943, **123**, 705). But there was still prejudice against what is termed the "doping" of troops or civilian defence workers in a combat area, despite the fact that holding on for a few hours longer may sometimes change defeat into victory. Such prejudices have not been so rigid in regard to socially accepted sedatives like small amounts of alcohol. In the last war the rum ration was an accepted and successful antidote to the development of neuroses in the front line, and larger quantities of alcohol were undoubtedly used on many occasions as an effective front-line sedative.

We have already reported the value of 'Sodium Amytal,' a short-acting barbiturate, in aborting or treating acute panic states under bombing and have shown how little it affects intellectual processes judged by intelligence-test scores, when given in small sedative doses (Slater, Sargant, and Glen 1942). A satisfactory prophylactic dose which enables a person to go on working if an emergency arises varies from gr. 1 to 3. In states of great excitement even more can be tolerated. If desirable it can be used in conjunction with amphetamine when fatigue is present.

METHOD

In this investigation we have compared the effects of [illegible] uivalent of a double [illegible]* and gr. 3 of sodium [illegible] a group of nervous patients. We have also observed clinically the behaviour of various groups while carrying out tests under sodium amytal and alcohol. Caffeine was used to provide a further control group.

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* At two licensed houses [illegible] were served [illegible] another only [illegible] 71 c.cm. of [illegible]

A programme of testing was incorporated in the hospital routine to collect the necessary data. Men admitted one week were tested on two successive days during the following week. The drug was administered on the second day. Alcohol was given in sufficient water with sufficient essence of gentian added to disguise its flavour. The other drugs were given in capsules. On the first day the men were given an inert dose. In the experiment with alcohol this was an equivalent quantity of flavoured water, and it was administered half an hour before the test; in the other experiments it was a capsule containing a small amount of glucose, administered an hour before. The men were retained on the spot until ready to do the test. This was Cattell Test 11 A, a verbal intelligence test in six sections—synonyms, classifications, opposites, analogies, sentence-completion and problems. Next day the men received the dose in which the drug was contained. They waited as before, and then took their second test, Cattell 11 B, which is identical in form and equivalent in difficulty, although the items in each section are different. The delay imposed was intended to allow each drug to produce its maximum effect.

The experiment continued until complete test records had been collected for 399 men, 97 of whom had been given alcohol before their second test, 98 caffeine, 103 sodium amytal, and 101 inert capsules on both occasions.

RESULTS

From the following table all conclusions have been deduced by statistical analysis, including analysis of variance.

Treatment	(*n*)	*a*	*b*	*a*²	*ab*	*b*²
Alcohol ..	582	53262	8324	5240394	820017	138920
Caffeine ..	588	53964	8897	5253660	860433	152969
Sodium amytal	618	54192	8592	5112744	804467	137784
Innocuous *	606	56166	9179	5531502	895407	156317
Total ..	2394	217584	34992	21138300	3380324	584990

* Glucose administered on both occasions.

The average score of the men on the A version of the test is 90·89.† The corresponding scores on the B version under each treatment are:

Alcohol	85·26	Sodium amytal ..	86·22
Caffeine	90·01	Innocuous ..	89·31

The score obtained when caffeine is administered is slightly, but not significantly, better than when no drug is given. Alcohol and sodium amytal both have a significantly adverse effect; sodium amytal slightly, but not significantly, less adverse than alcohol.

Unit differences in score correspond almost exactly with the units in the conventional IQ scale. A drop of 3 to 4 points in IQ, such as is produced by the stated dose of sodium amytal or alcohol, is not of any serious consequence. Within any occupational group, from tinker to apothecary or ploughboy, far wider variations in IQ can be demonstrated. Even in very highly selected groups, variations of over 30 points are the rule. Therefore if under normal conditions a man's intelligence is equal to the performance of a given duty, it will remain equal even after the stated doses of sodium amytal or alcohol have been administered.

Further, verbal intelligence, as measured by tests of the type used, plays a greater part in determining occupational efficiency generally than any other measurable psychological characteristic. These considerations lend generality to the conclusions which can be drawn from the present experiment. It should be noted, however, that there are some occupations which call for quickness of neuromuscular coördination and other specialised abilities not highly associated with intelligence, on which the drugs mentioned may have effects which cannot be predicted from the present observations.

Individuals might be expected to vary in their susceptibility to the drugs, some being comparatively immune, some adversely affected. Our observations do not confirm this expectation. In point of fact, if we know a man's score on the A test, and what effect a given dose can generally be expected to produce, we can predict his score on the B test with slightly greater precision when he is given it than when he is not. In giving the drug we have in fact introduced one further controlled determinant into the situation: it is therefore reasonable to find that precision is, if anything, slightly increased.

The experiment was planned so that if the drugs affected men's performance on one section of the test more than another, the extent of such differences could be measured and their significance tested. The results show that the effects, such as they are, appear to be generalised; no specific differences between sections are demonstrable.

While it was difficult to detect f [illegible] behaviour during tests whether sodiu[illegible] or inert tablets were being taken, the [illegible] small dose of alcohol was obvious and deleterious. Patients who had alcohol were often euphoric, sleepy, noisy, sometimes inattentive and full of back-chat compared with the control, caffeine and sodium amytal groups. The contrast in behaviour of the sodium amytal group as opposed to the alcohol group was greater than had been expected.

CONCLUSIONS

Sodium amytal in doses of gr. 1–3, which had been found clinically to be a more efficient and less toxic sedative than alcohol, has no greater effects on intelligence scores than the approximate alcoholic equivalent of a double whisky. If prophylactic sedation is necessary clinically in times of acute stress small doses of sodium amytal are preferable to alcohol.

We wish to thank Sister G. Oliver, SRN, for her help in this investigation.

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TREATMENT OF BATTLE CASUALTIES
TWO-STAGE OPERATION

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THIS report is in two parts. The first deals with 465 cases of flesh wounds treated in the second stage in a general hospital, using penicillin in powder or solution. The second part gives the results in 128 cases of open fractures (other than fractures of the femur) treated by similar methods.

I. SOFT-TISSUE WOUNDS

Three clinical wound states were noted. The first type, usually 48–96 hours old by air or sea evacuation, showed a clean wound with edges which were free and non-œdematous, while the base had a healthy "raw beef" appearance. Cultures from these wounds were either sterile or grew *Bact. coli* or diphtheroids. The second type, 5–6 days old, had edges slightly adherent to the base and beginning to show œdema, the base having a "glazed" greyish appearance. These wounds usually produced a scanty growth of *Staphylococcus aureus* (+) but on gentle swabbing of the exudate the bases were found to be healthy. The third type was the obviously infected wound, with *Staph. aureus* +++, hæmolytic streptococcus +, and reddened skin edge.

In the absence of a large number of holding beds forward, there is no question of the superiority of air evacuation for flesh wounds. Figures however cannot be produced to show any marked superiority in healing of the bacteriologically clean wound 2–3 days old over the wound 5 days old. The difference lies rather in the fine points of their mobile linear scar, as compared with the broader, thickened, and slightly adherent scar of the older wound.

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† Since there are six sections to each test, there are six independent measures of the effect of the drug on each man's performance. (*n*) is the number of observations. Each man's score on the A test is used to estimate his score on each section of the B test, and is therefore used six times. *Six times the score on* A of each man who received the sa[illegible] and listed in the second column (*a*). [illegible] sum of squares of scores on A is listed [illegible] *a*²). The third column (*b*) gives the total score on every section of the B test of all the men in each group; and the square of each score on every section is summed and given in the sixth column (*b*²). The fifth column shows the sum obtained by multiplying each man's score on each section of the B test by his total score on the A test, and adding the sum of the products for every member of the group.

Important as these considerations are, by far the most important factor in the policy of two-stage operation is efficient primary excision. Our figures show that penicillin can overcome any slight delay in evacuation, with its consequent mildly infected wounds, but penicillin can be of little avail in a wound which has not been properly treated at the primary operation.

A standard technique for the theatre should be used. *We have employed penicillin as a routine in all cases*, either by spraying the wound with calcium penicillin and sulphathiazole powder (2500 units per gramme); or by instillation of a solution of sodium penicillin, 500 units per c.cm. in normal saline (3 c.cm. twice daily for 5 days); or in a few cases of multiple wounds by a short parenteral course of sodium penicillin (200,000–300,000 units), either alone or combined with instillation.

TABLE I—RESULTS IN RELATION TO BACTERIOSTATIC USED AT PRIMARY OPERATION

Bacteriostatic at primary operation	No. of cases	Percentage wound healing at 10 days	No. completely healed in 14 days
Penicillin	167	90	128 (83%)
Sulphonamide	197	89	158 (82%)
None	70	63	35 (50%)*
Not recorded	31	..	..

* Includes 11 excised wounds unfit for suture, because of sepsis.

RESULTS

In all the 465 cases the wounds had been excised in the forward area and had been treated locally at the time of excision with either penicillin powder or sulphonamide powder, or deliberately given no local chemotherapy. The average time between wounding and primary excision was 17 hours. The average time between primary excision and suture was 6·5 days. The estimated average "per cent. healing" of *all* wounds was 83 at 10 days; at 12 days 75% of the wounds were completely healed.

TABLE II—RESULTS IN RELATION TO TIME OF OPERATIONS

Group	Bacteriostatic at primary operation	No. of cases	Percentage wound healing at 10 days	No. completely healed in 14 days	Group	No. of cases	Percentage wound healing at 10 days	No. completely healed in 14 days
1	Penicillin	37	94	32 (87%)	3	47	86	37 (78%)
	Sulphonamide	46	87	39 (85%)		78	89	60 (77%)
	None	13	70	9 (69%)		17	73	11 (65%)
	Not recorded	8	..	..		4	..	..
2	Penicillin	38	91	33 (87%)	4	45	88	36 (80%)
	Sulphonamide	33	90	28 (84%)		39	91	31 (80%)
	None	21	62	9 (43%)		19	48	6 (30%)
	Not recorded	9	..	..		10	..	..

In table I the results are classified according to the chemotherapeutic agent used at primary operation.

To assess how the interval between wounding and primary operation (interval A) and the interval between primary operation and suture (interval B) affect the results we have divided the wounds into four groups:

1. Where interval A is under 12 hours and interval B up to 5 days.
2. Where interval A is under 12 hours and interval B is 5–10 days or over.
3. Where interval A is 12–24 hours or over and interval B is up to 5 days.
4. Where interval A is 12–24 hours or over and interval B is 5–10 days or over.

In practice most of the cases were excised within 24 hours and sutured before 10 days, the average times being as stated—17 hours and 6·5 days (table II).

The number of cases in these groups is too small to allow of a definite conclusion, but the results seem to show (1) that provided wounds are excised within 24 hours and sutured within a week excellent results can be obtained; and (2) that wounds in which penicillin-sulphathiazole powder has been used at the primary operation differ little from those in which sulphonamide powder has been used. This finding has important bearing on surgery in tropical countries where penicillin could not be stored in the forward area at the correct temperature.

No sutured wound had to be reopened for spreading infection and no case developed clostridial infection.

SUMMARY AND CONCLUSIONS

The results of 465 flesh wounds treated by the two-stage method are described.

The two-stage method of suture with routine *penicillin* gives a high proportion of wounds healed in 14 days.

Local insufflation of a sulphonamide powder or penicillin powder at the time of the primary operation improves results.

There was little difference between wounds treated at *primary operation with sulphonamide powder and those* treated with a mixture of calcium penicillin and sulphathiazole.

II. OPEN FRACTURES

Extension of the two-stage procedure to the treatment of open fractures follows naturally, since these are but soft-tissue wounds complicated by bone damage. In the Gothic Line battle (September–October, 1944) we treated 128 open fractures brought from the fighting areas by air or sea convoy. No selection of cases was made, except that road accidents were excluded, and so were fractures of the femur, which were treated in special centres.

Using penicillin parenterally, very large doses would be needed to
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toma. To re
"wound excis… too radical to be justifiable. Our method was to instil sodium penicillin solution into the depths of the wound by means of tubes.

The introduction of tubes to the fracture site may be criticised as a potential source of infection, and there is also the risk that the tubes may leave sinuses after their withdrawal. But experience of their use in soft-tissue wounds led us to discount these dangers, and this confidence has been justified.

TECHNIQUE OF TREATMENT

In 73 of the 128 cases the wounds were excised within 12 hours of wounding, and in only 6 cases did 24 hours elapse. With very few exceptions the wounds were well excised and efficiently immobilised. *It cannot be too* often repeated that without early efficient excision all later treatment must fail. No apparent difference was noted in the clinical state of the wounds treated locally
nicillin-
ide and

On an average the second operation was performed on the 6th day after wounding. Under 'Pentothal' anæsthesia the plaster in which they had travelled was cut away and the dressings were removed with forceps. A wound swab was then taken for bacteriological examination. The limb was well shaved and cleaned with spirit, and towels were placed. A finger was now gently inserted into the wound to determine the extent of the injury and to ensure that no loculations of exudate were present. It was seldom that any other procedure was necessary. But if any foreign body was easily accessible it was removed, provided this did not entail a prolonged search.

The tubes for the instillation of the penicillin (diameter 4 mm.) were introduced through a stab-incision about ½–1 in. from the wound edge and guided to the fracture site. One to three tubes were used depending on the extent of the damage. In a penetrating injury with a 3-inch wound one tube would be used; a larger similar injury would have two or three. Most perforating injuries had at least one tube for each wound. Each tube was fixed in position by tying the long ends of a suture placed in the stab-incision around, but not through, the tube. This enabled it to be removed in 5 days without disturbing the dressings.

The technique then varied depending upon whether or not complete suture was possible. Where complete closure could be performed suture was proceeded with. No sutures were used for the muscular or fascial layers. The skin alone was approximated with interrupted stitches of silkworm-gut about ½ in. apart. Much care was taken to ensure edge-to-edge apposition. We did not hesitate to undercut freely when required, but we did not attempt skin-slides or skin-grafting at the time of suture. Many of the wounds closed were mildly infected. We made every effort to obtain complete closure in as many cases as possible, and this in some cases led to a fair degree of tension in the wound. This tension, provided it is not excessive, is not harmful where there is a good muscular layer between the skin and the bone. Where, as in tibial fractures with wounds along the subcutaneous surface, there is not this muscular layer, tension is inadmissible—it will result in failure every time.

Complete closure was not always practicable; in some cases skin loss was too extensive; in others there was evidence of established infection. In these cases the wounds were partially sutured. We aimed to reduce the wound area to a minimum, and do a skin-graft or complete suture later. In a few cases of extreme skin loss, even partial suture was impossible.

The wound was dressed, the fracture reduced if necessary, and a padded plaster-of-paris cast applied. In applying the plaster a hole was left through which the tube was brought. The first injection of sodium penicillin solution was made. A sterile swab tied around the doubled end of the tube by coloured tape both seals off the tube and enables it to be easily identified for ward treatment.

AFTER-TREATMENT

Sodium penicillin solution (3 c.cm. of a solution containing 500 Oxford units per c.cm.) was injected twice daily into each tube for 5 days (total 15,000 units per tube). Before injecting the solution aspiration through the tube of any collection of fluid exudate or pus was performed. Full aseptic precautions were observed. At the end of 5 days the tube was eased out of the plaster and the opening in the plaster was covered by a dressing. Each patient also received 300,000 units sodium penicillin by intramuscular injection (20,000 units every 3 hours). This course commenced on the day of operation.

On the 14th day the wounds were re-examined in the theatre, and the stitches removed. Where only partial suture had been carried out, it was sometimes possible to complete it either by suture or by skin-graft. A fresh plaster cast was then applied and the position of the fragment was checked by radiography.

No further inspection of the wound took place until the 6th week. At this time our final assessment was made because disposal had then to be decided. Cases were classified in three groups: (1) those completely healed; (2) those in which the fracture was sealed off and a granulating wound was present; (3) those in which the fracture was still open, either widely or by a small sinus.

RESULTS

Of the 128 fractures treated, 96 (75%) were closed by the 6th week (table III). Of these, 82 (64%) were completely closed with sound skin healing; the remaining 14 had healthy granulating wounds. In 32 cases (25%) there was still an open fracture. This figure, however, requires some elucidation, for the term "open fracture" is apt to imply widely open. In 9 cases no attempt to ould be made because of tissue loss, and of the remaining 23 the wound had closed down to a small sinus in 18 cases. In a large proportion of these healing could be expected in a few weeks. Of the remaining 5, one leg had to be amputated for clostridial infection with secondary hæmorrhage.

TABLE III—SUMMARY OF RESULTS (AT SIXTH WEEK)

Method of treatment	No. of cases	Closed fractures		Open fractures	
		Skin healed	Granulating wound	Small sinus	Widely open
Complete suture	86	72	3	9	2
Partial suture	33	10	11	9	3
Suture impossible	9	..	..	..	9
Total ..	128	82	14	18	14

Table IV sets out the results of complete suture as they apply to individual bones. Of the 86 complete sutures performed 75 (87%) were closed fractures in 6 weeks.

TABLE IV—RESULTS OF COMPLETE SUTURE

Bone	No. of cases	Closed fractures		Open fractures	
		Skin healed	Granulating wound	Small sinus	Widely open
Humerus	27	24	..	3	..
Tibia and fibula ..	19	11	2	4	2
Fibula alone ..	6	6	..	..	..
Radius and ulna ..	20	20	..	..	..
Scapula	6	5	..	1	..
Tarsals and metatarsals	6	4	1	1	..
Patella	1	1	..	..	..
Clavicle	1	1	..	..	..
Total	86	72	3	9	2

The failures occurred in situations where the bones were inadequately covered by soft tissue. Thus while the humerus, radius and/or ulna, fibula, and scapula fractures show results of 90–100%, the tibial and tarsal fractures give only 60–70%.

Table V gives the results of partial suture as they apply to individual bones. It shows that even if complete suture is not possible, partial suture should be attempted. Two out of every three will be closed in 6 weeks, and again complete failures will occur only where there is inadequate soft-tissue covering for the bone.

TABLE V—RESULTS OF PARTIAL SUTURE

Bone	No. of cases	Closed fractures		Open fractures	
		Skin healed	Granulating wound	Small sinus	More widely open
Humerus	4	2	1	1	..
Tibia and fibula ..	13	3	5	4	1
Fibula alone ..	2	..	2	..	..
Radius and ulna .	6	2	3	1	..
Tarsals and metatarsals	7	3	..	2	2
Scapula .. .	1	..	..	1	..
Total	33	10	11	9	3

Cases Unsuitable for Suture.—There were 9 cases in this group, comprising 4 with clostridial myositis, and 5 with extensive tissue loss and severe infection. All these cases were given the routine treatment. All were still open fractures at the 6th week, but 3 had closed by the 8th week after skin-grafting.

Formation of Callus—In a general hospital abroad it is not possible to keep all compound fractures to the stage of complete union Thus our conclusions are incomplete and based mainly on findings with respect to certain bones Table VI sets out the disposal of the various fractures at the 6th week with the extent of union then present

TABLE VI—DISPOSAL OF CASES (COMPLETE OR PARTIAL SUTURE) AT SIXTH WEEK

Bone	No of cases	To convalescent depot with firm union	Evacuated long term or remaining	
			Good callus	Poor callus
Humerus	31	13	14	4†
Tibia and fibula	32	3*	16	13
Radius and ulna	26	12	4	10‡
Scapula	7	5	2	
Tarsals and metatarsals	13	4	1	8§
Patella	1	1*		
Clavicle	1	1		
Fibula	8	4	4	
Total	119	43	41	35¶

* Incomplete fractures † 2 with marked bone loss ‡ 6 with marked bone loss § 3 with bone loss ¶ 11 with bone loss

It will be seen that of all … om pletely or partially, a … to convalescent depot by t … uch compares favou … callus was prese

Results were … Of 31 cases 27 united Of these 13 were sent to the convalescent depot and 14 were evacuated "long term" because of nerve palsies or associated injuries Similarly, of 26 fractures of the radius and ulna, 16 had firm union in 6 weeks We are therefore of opinion that except where there was much bone loss, union was as rapid in our series as if the fractures had been closed accidental injuries

Early Return of Function—To obtain a united compound fracture is one thing, to obtain union and keep adjacent joints in function is another Under penicillin therapy few patients have pain of any severity, and from the first they move freely in bed, and maintain good muscle tone All our cases had supervised active movements from the beginnu … and by "mass" ward … controlled by a whist … splintage early recovery … fe iture

Bacteriology—Wound swabs were taken from all cases as a routine Sterile cultures were obtained in 41% Non pyc … (… ultured in 40%—*Bact coli, Ps* … &c , *Staph aureus* in 5% and

SUMMARY AND CONCLUSIONS

A consecutive series of 128 open battle-casualty fractures (excluding femurs) were treated by local application of penicillin supplemented by a short course of … rug Within 6 weeks of … re closed … be performed, 87% were closed in 6 weeks

Routine bacteriological examination is unnecessary in assessing suitability for wound closure Clinical judgment is sufficient

Local instillation of penicillin to the fracture site is the method of choice, being both effective and economical

The transformation from open to closed fractures promotes early union and speedy return of function

We wish to express our thanks to Brigadier Harold Edwards consulting surgeon AFHQ for permission to publish this paper; to Colonel J H Ward DSO MC for permission to quote from hospital records, and to all the members of the surgical and nursing staff for their loyal cooperation

TREATMENT, OF BATTLE CASUALTIES
TWO-STAGE OPERATION

A C TURNER, MB BELF, FRCSE
LIEUT COLONEL RAMC

A A MURRAY, MB EDIN
MAJOR RAMC

G A FOWLER, MB CAMB
CAPTAIN RAMC

THIS contribution is from a forward general hospital acting as a casualty clearing station in Italy last autumn During the early phase of the battle cases were received direct from the front, and the first stage of the operation was performed in this unit Later, as the battle moved forward, the first stage was performed at the more advanced units, and the cases were evacuated to this hospital for the second stage The observations, therefore, are based on the experience of both stages, with special reference to soft tissue wounds

FIRST STAGE

In the two months selected for review 880 primary wound excisions were performed

> *Among them there were 7 cases of gas gangrene* In 6 of these a heavy growth of clostridia was obtained on muscle culture (2 with presumptive *Cl welchii*) The 7th case was a clinical gas gangrene of all compartments of the lower limb, and bacteriological examination was not undertaken Surgical excision of the affected muscles was performed in 4 cases in the remainder, two or more muscular compartments of the limb were involved, and *amputation was required These cases were held and there* were no deaths

The results of the first stage operation as a whole cannot be given, for the cases were quickly evacuated to the base general hospitals

SECOND STAGE

In the second phase of the battle, when our unit was *acting as a base hospital*, we operated on 175 cases in which the primary excision had already been performed … ms A favourable time for the … tion is between the 3rd and 5th … cision

… in assessment of results, the following standards have been laid down A wound healed at the 10th day with subsequent uneventful progress, is assessed at 100% Thereafter 5% is deducted for each day a wound remains unhealed, and if healing is incomplete after 20 days the second stage operation is judged a failure The table shows our results according to these criteria

TABLE OF RESULTS OF DELAYED PRIMARY SUTURE

Wounds sutured	Successful (100%)	Partially successful (95–50%)	Failures	To be traced
175	111 (63.4%)	[illegible]	15 (8.6%)	10

ANALYSIS OF FAILURES

Wounds	Type 1	Type 2	Type 3	Total
Failures	[illegible]	4	6	15

Cases included in types 2 and 3 are generally considered unfit for discharge before the 21st day, as this period is required for union of the deeper tissues A total of 141 (80.1%) of cases were fit for discharge to unit or convalescent depot between the 21st and 28th days

In 4 out of 7 cases of gas gangrene delayed suture was attempted 2 healed in 10 days 1 was a partial success and 1 a failure, while the remaining 3 were evacuated for definitive amputation

We wish to express our thanks to Brigadier H C Edwards and Colonel D McVicker … for permission to publish this … W H Cammack, … for their invaluable assistance … gave … our thanks for help in preparing our report

TREATMENT OF BATTLE CASUALTIES

SECOND STAGE IN TWO-STAGE OPERATION

H. J. B. ATKINS
M CH, D M OXFD, F R C S
LIEUT-COLONEL RAMC

B. HOLDEN
M B CAMB., F R C S
MAJOR RAMC

CASES reaching our base hospital, generally between the 2nd and the 7th day after wounding, have had the first stage of their operative treatment performed at a forward unit (casualty-clearing station, field dressing-station, or field surgical unit). This treatment has consisted in control of "shock," arrest of hæmorrhage, wound toilet with decompression, chemotherapy, and immobilisation of the part so far as practicable. Forward units have recently been using calcium penicillin (2000 units per gramme) in sulphathiazole powder ("penicillin powder") and this, together with the increasing experience of the forward surgeons, has accounted for the fact that the overwhelming majority of patients in the Italian theatre of war reach the base feeling and looking well, and with clean wounds ready for suture. The members of our surgical division, most of whom have had intimate experience in the handling of battle casualties from the beginning of the North African campaign, would like to express their admiration for the work done by their colleagues in forward areas inevitably under adverse conditions.

The second stage in the operative treatment consists in delayed primary suture, secondary suture, skin-grafting, or a combination of these. No wound is now allowed to "granulate up and epithelialise over": as soon as possible it is *covered by skin*. Modern methods of skin-grafting, and the use of penicillin, have allowed us to suture and to graft wounds which would hitherto have been left to heal spontaneously, and it is believed that these new techniques have cut down the period of stay in hospital; they have reduced morbidity, and they have practically abolished "chronic sepsis" as a major surgical and administrative problem. Where complete suture has not been possible, through lack of skin, or because it would leave a dead space unobliterated in the depths ("tentage"), the wound has been subjected to partial suture and subsequent skin-grafting. This difficulty is often encountered in the region of the greater trochanter and anterior superior spines of the pelvis.

During the quarter under review (July to September, 1944) these procedures were undertaken at different times. That is, the wound was sutured as far as possible at the first operation and grafting was performed later when the granulations covering the remainder of the wound were clean. Such cases have been reported in this series twice, once as sutures and again as grafts. With increasing confidence we have come to graft raw surfaces much earlier, and now, in most of the cases treated by both partial suture and skin-grafting, the two procedures are done at the same time. A series of cases covering the succeeding quarter would therefore have to include, as a special category, cases of "suture plus graft."

Owing to the large number of cases dealt with, the bacteriology of the wounds has not (until recently) been systematically investigated, and indications and contra-indications for the three main categories of treatment have been based on clinical features only. In analysing our results we have taken the quarter, July to September, as typical of the work the hospital is called upon to perform, and it is a period during which established and almost identical methods were being used by all the surgeons concerned.

DELAYED PRIMARY SUTURE

This method, which is here defined as the suture of wounds between the 2nd and 8th day after they have been sustained, is the treatment of choice and is practised in every case unless contra-indicated. The contra-indications to delayed primary suture are (1) insufficient skin and (2) anaerobic interstitial cellulitis or gas gangrene: other forms of sepsis are not considered contra-indications. With the help of penicillin, either in powder form or in solution, the vast majority of wounds which have been treated according to established principles can be sutured after 72 hours. If there is any doubt, then it is worth suturing the wound, as no case in our series which has been sutured has suffered from that step and the worst that can happen is that the suture is a failure.

The best time for delayed primary suture is on the 3rd or 4th day after wounding. Every day after the 4th, suture becomes less easy.

When the wound is shallow, simple and regular, penicillin powder is insufflated over the surface and the skin is sutured with silkworm gut or 'Nylon' (no. N4). Tension is not a serious danger to the integrity of the suture line: if the wound can be drawn together without jeopardy to the blood-supply of the limb as a whole, it should be sutured.

When the wound is deep and complex, penicillin solution (500 units per c.cm.) has been used instead of powder. Depending on the size of the wound, one or more rubber tubes (2–3 mm. in internal diameter) are introduced into the wound through conveniently placed stab-holes, not less than 2 cm. from the wound edge, and the inner ends of the tubes are adjusted so that the penicillin solution when injected can reach all parts of the wound. As a routine 5 c.cm. of penicillin solution is injected through each tube at the conclusion of the operation and the tube is then occluded by kinking it over gauze and strapping it to the part. Twice a day for the next 5 days the tube is exposed and discharges are aspirated by means of a syringe. When the wound has been sucked dry, 5 c.cm. of penicillin solution is introduced into each tube by means of a fresh syringe. On the 6th day no solution is run in, but aspiration of the wound may be carried out, and on the 7th day the wound is dressed and the penicillin tubes are removed.

The volume of penicillin solution must be small enough not to flood the suture line. Accordingly the strength has recently been doubled (1000 units per c.cm.) and the volume of each instillation halved. In the series under review, however, the weaker solution was used.

In assessing our results we have taken "success" to mean that the wound was healed completely by the 10th day, when the second dressing is done, and that it remained healed. The term "partial success" is applied to any wound which is not completely healed within 10 days, but in which more than half the length is healed and stays healed after 10 days. Where less than half the length of the wound is healed after 10 days the result is classed as a "failure," but many such failures have been benefited, and in no case has harm followed the operation.

Using these standards our results for delayed primary suture in July–September, 1944, are:

Cases	665 (no deaths)	Partial successes ..	127
Successes	512	Failures	26

In addition 82 cases of open fracture were similarly treated, but in these the local treatment was supplemented by a course of parenteral penicillin (480,000 units)—a procedure now considered unnecessary in the majority of cases. When assessing results in fracture cases we have considered that the purpose of the suture is to convert an open into a closed fracture and that this has been done only if the wound is dry on the 10th day. Hence cases which would be listed in the soft-tissue series as partial successes are in this group included under failures, since it is assumed that healing of any part of the wound by second intention renders union of the underlying fracture liable to the retarding influences of sepsis.

Our results in this series are:

Cases of open fracture	82 (no deaths)
Successes (converted to a closed fracture in 10 days)	72
Failures	10

The smaller proportion of failures in this series as compared with the soft-tissue series is probably accounted for by the more complete immobilisation which the underlying fracture requires.

SECONDARY SUTURE

For the purpose of this paper secondary suture is defined as the suture of a wound after the 8th day. Penicillin powder and penicillin solution are used in secondary suture in the same way as in delayed primary suture, and the use of penicillin has rendered septic wounds amenable to treatment by this method which would formerly have been left to heal by slow spontaneous epithelialisation. Where excision of the septic tissue would have to be so extensive as to leave dead space in the depths (tentage) or skin inadequacy on the surface, the wound may be partially sutured and the remainder grafted later.

Our results for secondary suture during the same quarter were:

Cases	20 (no deaths)	Partial successes ..	2
Successes	16	Failures	2

The 2 failures were due to inadequate hæmostasis after the wound had been excised, leading to hæmatoma formation and rupture of the hæmatoma through the incision with complete breakdown of the suture line.

SKIN-GRAFTING

Three types of graft have been used in our cases—the Thiersch graft, the pinch graft, and the patch graft. The last consists of an epithelial layer of the same thickness as a Thiersch graft, which is spread out on a piece of greasy paper (the paper used for separating pieces of tulle-gras has been found ideal).

Our results during the quarter are:

Graft	Cases	Successes (more than 80% of surface covered by skin in 10 days)	Partial successes (50–80% covered)	Failures (under 50% covered)
Pinch ..	45	35	5	5
Patch ..	29	20*	7	2
Thiersch	6	3	2	1

* One case in this series died from hepatic failure due to another cause many weeks after his grafts had healed.

SUMMARY AND CONCLUSIONS

1. During the quarter July to September, 1944, the surgical division of a base hospital performed the second-stage operation on 847 wounds.

2. These operations consisted in delayed primary suture, secondary suture, and skin-grafting. Among the cases treated by delayed primary suture were 82 open fractures.

3. According to the standards adopted, of the 847 wounds 658 were complete successes, 143 partial successes, and 46 failures. There was one death, from a cause unrelated to the wound.

4. Success depends on careful surgery, hæmostasis, avoidance of "tentage," correct dosage of penicillin, application of firm pressure dressings, and adequate immobilisation after the operation.

We wish to thank Colonel C. H. K. Smith, OBE, MC, for permission to publish this paper, and Brigadier Harold Edwards for his encouragement and advice. Our thanks are also due to Lieut.-Colonel I. H. Bentley, Lieut.-Colonel J. R. Cameron, Major Guy Blackburn, MBE, Captain M. H. Wostenholm, Captain R. Welch, and Captain J. H. Moir, who operated on some of the cases in the series quoted. The anæsthetics were throughout under the skilled supervision of Major H. D. K. Wright. Captains A. K. Bingham, J. A. Key, H. F. Lunn, G. A. Robinson, P. Story, and K. R. Todd, and Lieut. R. E. S. Turner, trainees in surgery or general duty officers working in the division, have been responsible for much of the practical and all the documentary work involved. A large contributory factor in any success achieved is the general excellence of the nursing care which the cases received.

COMPOUND FRACTURE OF FEMUR

TWO-STAGE OPERATION

R. J. B. McEwen
M B SYDNEY

J. G. Bickerton
M CH ORTH LPOOL, M B EDIN.

MAJORS RAMC

M. F. Pilcher, M B LOND.
CAPTAIN RAMC

In an orthopædic centre working in Italy 64 cases of compound fracture of the femur were treated with intramuscular sodium penicillin. Most of them were battle casualties and many were suffering from other injuries. They arrived in hospital up to 16 days after wounding, splinted in Thomas splints with encircling plaster. Almost always their wounds had been dealt with in forward surgical units by trimming, and removal of dead tissues and foreign matter; the wounds had been left open under a dres[illegible] penicillin powder or powdered [illegible] or paraffin gauze. Almost all [illegible] given antitetanic serum and a short oral course of sulphanilamide; many had received gas-gangrene serum, and a large proportion had had transfusions of blood or plasma. A few had had short courses (about 300,000 units) of parenteral sodium penicillin.

TREATMENT IN THE ORTHOPÆDIC CENTRE

Treatment of the wounds [illegible] a wound swab was taken for [illegible] The surrounding skin was [illegible] and reshaved, and the who[illegible] was washed with saline. The wounds were then "revised" and if necessary reopened or completely excised. In surgically clean wounds the skin edges were undercut and sutured together, often under considerable tension, with interrupted silkworm-gut sutures, leaving an area about the size of a shilling unsutured to allow the escape of discharges. These clean wounds were never reopened by us; they were closed irrespective of the presence of metallic foreign bodies except in the rare case of one retained between the bone fragments. No counter-incision was made for dependent drainage and no drainage material was left in any clean wound.

A dry dressing was applied and was rarely disturbed for 21 days. The first dressing was then done and the sutures removed; further dressings were performed as infrequently as possible—say once weekly or once a month. Wound swabs were taken at each dressing. In some of our cases the wounds were so large that delayed primary or secondary suture was impossible.

In frankly purulent wounds, partial suture was performed and one or two fine rubber tubes were inserted for the local instillation of sodium penicillin solution (500 units per c.cm.).

Dirty wounds smelling of gas, but without gangrene, had penicillin tubes inserted, and the fracture area was drained [illegible] hrough the posterior compart[illegible] small drain of dry gauze or [illegible] the latter, and 3 c.cm. of sodiu[illegible] instilled through each tube twi[illegible]s. By this means the sodium penicillin was allowed to seep through the infected area for several days. The tubes and drain were then removed, and possibly the anterior wounds were loosely sutured. All these cases received parenteral sodium penicillin as well, and large repeated doses of gas-gangrene serum. Not one failed to respond.

In the rare case of spreading infection or of established gas-gangrene, wide open drainage of the thigh was established.

So good was the work of the forward surgeons in the Central Mediterranean Command that most wounds complicated by major fractures arriving at our centre were clean enough for prompt closure without resort to reopening or drainage.

Treatment of the fractured femur.—The Thomas splint was used for most, with either skin traction or skeletal traction. Fractures in the hip region were treated [illegible] n Russel traction was found [illegible] easure in hip fractures with [illegible] their "cleaning up." No [illegible] in the rate of union followed the exhibition of sodium penicillin.

Sodium penicillin.—Our early cases received an intramuscular 5-day course totalling 540,000 units. Latterly, as more penicillin became available, we gave a 10-day course as a routine. The first injection was given in the theatre at the end of the operation; thereafter the injections were repeated every three hours for the first 3 days, and every four hours for the next 7 days. Each injection consisted of 20,000 units in 2 c.cm. of distilled water and the total 10-day course amounted to 1,320,000 units.

RESULTS

Successful suture.—A case was regarded as successful if it was converted from an open to a closed fracture within a reasonable time. Our assessment of reasonable time depended upon the size and site of the original wounds and the possibility of closing them by suture. For instance one patient had one clean linear wound, 8 in. in length, of the mid thigh which was sutured without difficulty; it healed in 18 days. Another, on the other hand, had two clinically dirty wounds, one of which measured 9 × 4 in.; there was very extensive destruction of the buttock muscles and comminution of the great trochanter and femoral neck. It was not possible to close the large wound completely and healing was necessarily slower. We regarded this case as eminently successful when the skin was healed completely in 91 days without any antecedent sepsis.

Judged by these standards success was attained in 47 (80%) of the 59 cases in which delayed primary, or secondary, suture was performed. The average time of healing was 34 days.

Many of the successful cases had large wounds with considerable destruction of soft tissues and bone. Six of them still have one or more metallic bodies in situ. Three had large buttock wounds with comminution of the upper end of the femur. These compound fractures of the hip with buttock wounds and gross muscle destruction are the types of case above all others which demand closure and sodium penicillin. With other forms of treatment, the usual sequel is prolonged suppuration and invalidism and even worse. Of the successful cases, 11 had wounds and fractures involving the knee-joint.

Unsuccessful suture.—The 12 cases described as "failures" were failures only in that the open fractures were not converted into closed ones in a reasonable time. Nevertheless, in the majority of them progress seemed far better than if sodium penicillin had been withheld. Their general condition never gave cause for anxiety, no chronic septic state ever developed, and no amputation or death was recorded.

No suture.—There were 5 cases treated with parenteral sodium penicillin in which it was impossible to suture the wounds, because of their size or gross infection. Of these, 2 were successful and 3 were failures.

COMMENT

From the analysis of our 64 cases it is not possible to arrive at dogmatic conclusions; but the following points have impressed us:

(1) Better results were obtained when the wounds were sutured than when they were left open.

(2) The best results followed closure between the 6th and 10th day (inclusive) after wounding. Of the 21 cases sutured before the 6th day, 7 (33%) were failures, Of 25 sutured between the 6th and 10th days, 2 (8%) were failures. Of 10 sutured after the 10th day, 3 (30%) were failures.

(3) The rate of healing improved when a 10-day course of penicillin (1,320,000 units) was substituted for the 5-day course (540,000 units). The average time of healing in the former was 27 days; with the shorter course it was 43.

(4) Sodium penicillin treatment did not retard the rate of union of the fractures.

(5) The presence of metallic foreign bodies did not appear to affect materially the prospects of healing.

Our thanks are due to Captain C. C. S. Pike, for his painstaking bacteriological investigations and to Major A. B. Wayte for his ever-ready help in his X-ray department.

DELAYED AND SECONDARY SUTURE OF WAR WOUNDS

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MAJOR, INDIAN MEDICAL SERVICE

THIS paper is based on 404 wounds sutured during September and October, 1944, in Italy. Suture within 10 days of primary excision is described as delayed primary suture, while suture after 10 days is termed secondary suture.

Before operation the general condition of the patient needs review. He was allowed at least 24 hours' rest after admission to recover from the fatigue of journey. During this time blood examinations were carried out and blood-transfusions given if necessary. A preoperative 24-hour course of sodium penicillin, 15,000 units three-hourly by injection, was given to patients with multiple wounds or with compound fractures of large bones. No dressing of wounds was allowed in the wards and their first inspection was invariably done in the operating-theatre.

RESULTS

Delayed primary suture.—In this group 177 wounds were sutured. These are classified as (1) soft-tissue wounds, and (2) wounds communicating with compound fractures (table I).

TABLE I—RESULTS OF DELAYED PRIMARY SUTURE

Wounds	No. sutured	Completely healed by first intention (100%)	Healed 90–99%	Healed 50–89%	Healed below 50%
Soft-tissue only	114	109	3	2	..
Communicating with fractures	63	57	2	3	1
Total	177	166 (96·6%)	5	5	1

Excision and secondary suture.—In this group 227 wounds were sutured (table II).

TABLE II—RESULTS OF SECONDARY SUTURE

Wounds	No. sutured	Completely healed by first intention (100%)	Healed 90–99%	Healed 50–89%	Healed below 50%
Soft tissue only	137	112	6	16	3
Communicating with compound fractures	90	73	4	8	5
Total	227	185 (85·9%)	10	24	8

These wounds were all older than 10 days. Some of them were infected and covered with unhealthy, anæmic granulations and with a varying amount of discharge. These wounds were treated with eusol dressings daily, until they presented a reddish raw appearance.

When gross loss of skin prevented complete closure, partial suturing was done and the residual wound was grafted later on. In some cases advancing, transported, and rotation flaps were used.

CHEMOTHERAPY

Sulphanilamide, proflavine-sulphathiazole, and calcium penicillin were used for local insufflation of superficial wounds before closure. The choice depended on their availability. Though no definite record was kept, there appeared to be little difference in their effectiveness.

Sodium penicillin locally.—In deep wounds where rubber tubes had been introduced, 3 c.cm. of sodium penicillin solution (500 units per c.cm.) was instilled into each tube after aspiration, twice a day for 5 days. The tubes were left in situ for 2 days longer and aspirated daily. Bacteriological examination of the aspirated discharge usually showed absence of gram-positive organisms after the 3rd day. By the 7th day, in most cases, little or no discharge was obtained on aspiration.

In 2 cases of compound fracture of the femur, the tubes were left in for 9 days. Though an appreciable amount of gram-negative pus was aspirated on the 9th day, the tubes were removed then because it was felt that their prolonged presence might cause sinus formation. The wound of both these cases healed readily.

Cases with multiple wounds and with compound fractures received parenteral penicillin, 15,000 units three-hourly, for a further 2–3 days. Blood-transfusion was repeated where necessary. Sutures were removed on the 10th day. The movements of the injured area were restricted for a few days longer, according to the size and depth of the wound, in order to allow firm healing of the deeper structures.

COMMENT

The 3 days' minimal delay between primary excision and suturing is important for several reasons. It gives an interval between anæsthesias. It also gives a phase of readjustment for the local circulation in the traumatised tissues, and a period of free drainage to the wounds. Wounds several weeks old remain remarkably healthy, provided the primary excision is thorough, provided drainage is adequate, and provided they escape meddlesome "curiosity" dressings and the still more meddlesome "sympathy" dressings.

There is no contra-indication to closure of wounds in communication with compound fractures, and the results of suturing these are as satisfactory as those of soft-tissue wounds.

Suture of wounds has reduced the average period of stay in hospital.
and discomfort t
incidence of ch
improve; they feel better, develop hearty appetites, and look cheerful.

I wish to thank Lieut.-Colonel M. Kirk Bryce, IMS, for his help and advice in the preparation of this report.

PRIMARY CLOSURE OF BATTLE WOUNDS OF THE FACE

REX LAWRIE, M D LOND, M R C P, F R C S
CAPTAIN RAMC; GRADED SURGEON

A RECENT article on forward surgery contained the following passage:

> "The chief justification for an advanced maxillo-facial team was for the fractured jaw patient to have uniform early and adequate fixation—the dental surgeon's business. Splitting of the team as it was done sent forward also a *surgeon with plastic training. This was still more experimental and of doubtful value*"[1]

This paper is intended as a commentary on that statement and provides some examples of a modern trend in the forward surgery of maxillo-facial battle wounds—their primary closure. It describes the work done in a typical 8 weeks' busy period by a light forward detachment from the main team, consisting of graded surgeon and other-rank assistant, dental specialist, clerk orderly, mechanic, and anæsthetist. During this period the detachment had one move

It was not until January, 1944, when a detachment of the team established a forward base at Naples, that we had the opportunity of treating fresh battle casualties—often within a few hours of injury, thanks to a most efficient organisation for sorting and evacuation of cases. It was at the height of the rush of casualties from the Anzio landings and the Garigliano battles that we embarked on a policy of early closure of facial wounds that has increased in scope ever since.

TECHNIQUE OF EARLY CLOSURE

If any facial wound is allowed to heal naturally, a scar will result,
to avoid sca
ally cut skin
normal subcutaneous tissue, with perfect hæmostasis, no tension, and no infection; then to remove the stitches in 2 or 3 days. For a satisfactory result, there must also be no distortion of the features. That is the basis of all scar corrections

A similar procedure can be used to close the wound at a

with catgut, the skin is accurately sutured, and a pressure bandage is applied. The amount of skin excised is no more than would be sacrificed were the wound left to heal and a formal scar correction done. The obvious difference is the danger of infection, and it has been found
y is near the upper limit of safety
es. Up to that limit, primary
be consistently achieved. The
generally good, but not quite so good as that of cold scar corrections done under ideal conditions.

In battle inj
cavities, maxilla
and zygoma are
has shown that these too may be closed with consistent success, after a very careful toilet with removal of all loose bone fragments and tissues of uncertain vitality, remembering that any dead tissue left behind is almost sure to suppurate. In cases of mandibular comminution involving tooth sockets, bone suppuration is common, and it is often wise to drain the wound

Most of the cases here reported were operated on in a tented theatre, without using gowns or gloves; in any case many wounds involved the buccal or nasal cavities. In spite of this, sepsis has been conspicuously absent.

TABLE I—ANALYSIS OF 8 WEEKS' WORK

Cases treated: 379 (jaw fractures 89) Returned to duty 134.
Operations done: 270.
Cases in which primary closures were done: 140.

It will be seen from table I that over half the operations done included primary wound closures.

TABLE II—ANALYSIS OF PRIMARY CLOSURES

	Total	Returned to duty	Evacuated	Death
Major alone	21	11 after aver. 6 days 2 (infected) after 12 days	8	0
Complicated	41	0	40 (20 jaws)	1
Minor alone	59	53 after aver. 4·3 days 3 (infected) after 11 days	3	0
Complicated	19	0	18 (10 general surgery)	1
Total	140			

Table II analyses the results of those closures. In this table, a major closure is defined as one involving a compound fracture or antral or buccopharyngeal cavities.

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ear,
These were both
fit fo
" implies a complication which inevitably makes the case a long-term one for evacuation to base. Multiple closures on the same patient are counted as one case. All cases were held until the stitches were removed and the danger of immediate infective complications was past. They were then evacuated to the main section of the unit if there was no reasonable prospect of return to duty within a week. It will be seen that 60% of major and 95% of minor uncomplicated closures were returned to duty without evacuation to base; and that in this series 64 battle casualties of the face, treated by primary closure, were returned to duty within a week.

COMPLICATIONS

There were 5 cases complicated by local infection, all of which rapidly responded to treatment, and 2 deaths, 1 from bronchopneumonia and 1 from other injuries.

Of the discharged cases, 2 came back: 1 had a small abscess in a skin wound of eyebrow; the other had pain and mild infection of the nose from which a 1¼ in. shell-fragment had been removed. He was evacuated to base,

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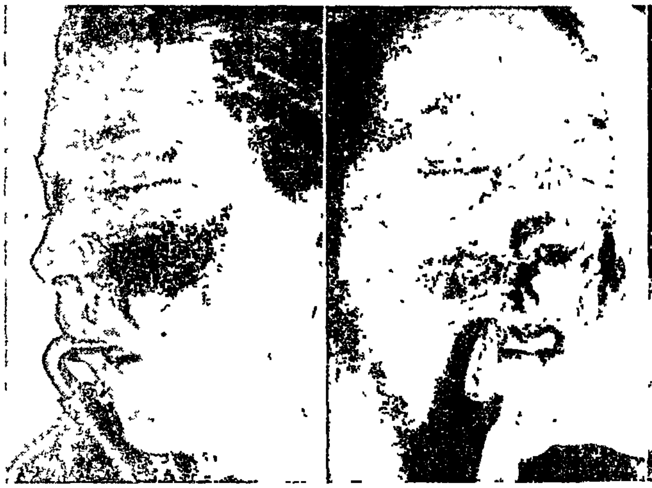
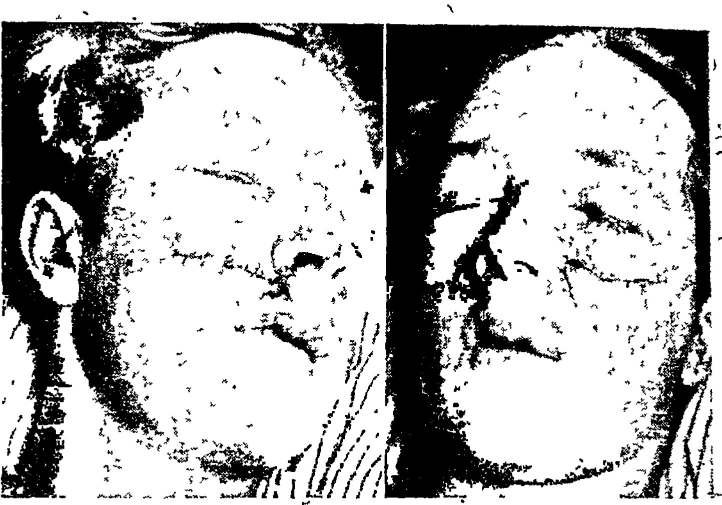
[1] Donald, C. *Brit. med. J.* 1944, i, 709.



Figs. 1 and 2—On admission, 14 hours after injury



Figs. 3 and 4—Four days later. Face healing without inflammation. Three quarters of the sutures removed.

Among the cases evacuated to base there developed later: 1 parotid fistula, 1 subcutaneous hæmatoma which was aspirated and healed without further complication, 1 case of mandibular sepsis, which required drainage but did not involve a sacrifice of the 2 in. facial suture line, and 3 cases of minor breakdown of facial suture lines. A proportion also developed minor degrees of moisture of the suture lines.

ADVANTAGES AND LIMITATIONS

The advantages of primary closure are:

1. *Quicker recovery.*—Simple, uncomplicated soft-tissue wounds are able to return to duty as soon as the sutures are out, with minimal scar. As is shown in table II, the average stay in hospital is 4·3 days for minor closures, 6 days for major ones. Closure shortens the incapacity period from even the smallest wounds and the cosmetic result is better.

2. *Reduction of ward work.*—Where complicating injuries make the patient a long-term case, primary soft-tissue closure is a great boon. No dressings are needed after the first few days, and this is a help to the ward staffs and saves the patient much discomfort and suffering.

3. *Fewer complications.*—In cases involving bone, successful closure prevents bone infection, with its chronic discharging sinuses, sequestrectomies, and acute inflammatory episodes. The stage of disfigurement which used to last weeks or months is reduced to a matter of hours.

The method is sometimes inapplicable to grossly abraded wounds with much skin contusion in sites where skin can ill be spared. Mere skin loss is no contra-indication, as partial closures usually hold and split-skin grafts can be used to close the residual skin defect.

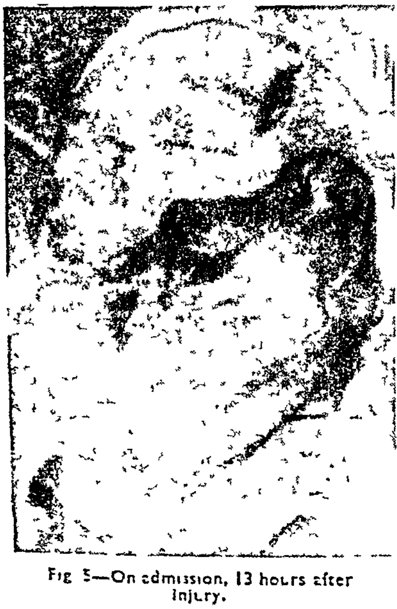


Fig. 5—On admission, 13 hours after injury.

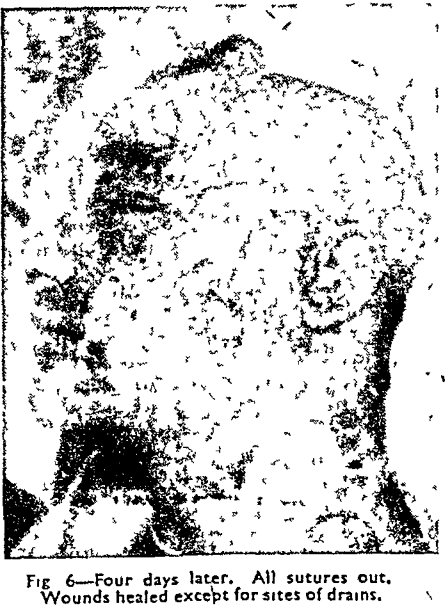


Fig. 6—Four days later. All sutures out. Wounds healed except for sites of drains.

One other difficulty is that it is often necessary to fit dental splints for jaw fixation within a day or two of the injury, and the manipulations involved endanger the newly healed suture lines. The risk of breakdown can be eliminated by a few large-bite, deep, stout silk sutures embracing the suture line, which are removed at the end of the operation.

ANTRAL CLOSURES

There were 13 primary closures of major antral wounds. In these cases there is generally a gross traumatic nasal antrostomy, and that makes it safe to close the skin over the antral defect. The standard procedure, so far as any battle operation can be standardised, is to remove all fragmented bone and lacerated soft tissue that has no functional importance or no chance of survival, to secure antral hæmostasis by very hot flavine packs, to perform marginal skin excision and undermining, apply about 0·5 gramme of penicillin-sulphathiazole powder, and close a deeper soft-tissue layer with 6/0 catgut and the skin with fine silk. A paraffin-gauze-flavine pressure dressing is then applied and the sutures removed on the 2nd and 3rd or 4th day, after which dressings are usually omitted. All cases have a routine course of oral sulphathiazole, 1·0 g. four-hourly for 4 days.

RÔLE OF PENICILLIN

In all the major closures and about half the minor closures in this series, penicillin-sulphathiazole powder, 0·5–1·0 g., was smeared throughout the wound. A previous series of similar cases was done in January–April, 1944, without penicillin or other local chemotherapy and it was hoped that they would provide a control series. However in some important respects they are not strictly comparable; most of them were operated on much later and many were really secondary closures.

The effect of penicillin is not immediately spectacular and cannot be statistically proved by these series of cases; but the following observations emerge from a study of the records: (1) Closures of antral and other compound face wounds (e.g., gunshot wounds of mandible) can be done successfully with or without the use of penicillin. (2) Local penicillin definitely reduces the incidence of stitch infection and cellulitis of the face in the region of a major primary closure. (3) Thus the standard of the successes is raised; but their proportion and the scope of major primary closures is not much affected.

My thanks are due to the late Major P. W. Clarkson, RAMC, under whose direction this work was conceived and done; to the late Major T. H. H. Wilson, Army Dental Corps, for his cooperation and first-class dental work; to Major G. K. T. Roche, RAMC, for his skill in anæsthetising these difficult cases; and to the tireless willingness of the theatre staff, Cpls Parker, RAMC, and May, AD Corps.

CONJUNCTIVAL HÆMORRHAGE AFTER BISMUTH INJECTION

E. LIPMAN COHEN, M B CAMB.
CAPTAIN RAMC, GRADED DERMATOLOGIST
PHYSICIAN TO THE WESTERN SKIN HOSPITAL, LONDON

IT is uncommon for complications other than stomatitis to follow the intramuscular injection of bismuth, though colitis, various skin eruptions, and emboli occur rarely. A careful search has revealed only one published case similar to the one to be described.

A single woman, aged 30, complained of a rash on the face and hands which she had had for six weeks. Seven years previously she had an eruption which "looked like an erythema multiforme." She had typical patches of lupus erythematosus on the bridge of her nose and on each cheek immediately under the eyes; she had also a few lesions on the backs of her hands and fingers. She was put to bed and given an intramuscular injection of 1 c.cm. of 'Bismostab.' Ten days later the injection was repeated and six hours later she complained of bleeding in the eyes. She had a subconjunctival hæmorrhage into the upper nasal quadrant of each eye. She was kept in bed without further treatment and the conjunctivæ were quite clear in two weeks. No further

recognised as a complica-

Goti (1028) reported the case of a woman of 35 whose diastolic blood-pressure was 130 mm. Hg. Her sputum was blood-tinged after her second injection of bismuth. A third injection a week later produced a frank hæmoptysis and another after a further fortnight was followed by a severe hæmoptysis and hæmatemesis. She had no abnormal bleeding at any other time. Mienicki (1920) described a case of hæmoptysis and stomatitis following three injections of bismuth.

of bismuth
by Nicolas
a very interesting case in which a second injection of bismuth, two days after the first, was followed a day later by bilateral conjunctival hæmorrhages. These cleared in thirty days and another injection was given. The next day there was a recurrence of the hæmorrhage. There appears to be no satisfactory explanation of the bilateral conjunctival hæmorrhage.

I have to thank Dr. J. Elder for this patient's previous dermatological history and Captain (Miss) E. J. B. Orr, RAMC, for her help in the treatment.

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Medical Societies

MEDICAL SOCIETY OF LONDON

AT the meeting of the society on April 23, with Dr. ANTHONY FEILING, the president, in the chair, Mr. SAMPSON HANDLEY read a paper on

Deferment of Senescence

In an ageing community such as ours, he said, the problem is of growing importance. A successful solution would contribute to the happiness both of the aged and of the succeeding generation now responsible for their parents' welfare. Sacrifices made on behalf of invalid parents are no doubt noble, but it would be better for both generations if they were unnecessary. If there are to be more old people in the community, the age of retirement should be placed higher than at present. In the absence of disability it could probably be raised to 70 instead of the present 60 or 65. In this country, with war ravages to repair, there will be no shortage of work for a generation, and if the aged can help so much the better both for them and their children. He pointed to the zest and vigour of the Prime Minister at the age of 70 as an inspiration.

Many people in middle age, he said, deliberately sit down to grow old. They can usually be recognised by their dorsal kyphosis and inability to flex and extend the spine to its full extent. It is important, he believes, to put every joint in the body, and especially those of the
movement daily. Three
sting on rising not only
the spine and its joints,
or rheumatic changes in

ue-fluids. The testicle
dhood, when growth is
be of the first import-
The signs of old age, he suggested, are largely those of failing thyroid function, and the thyroid in old people is often impalpable. Crile showed that animals living in cold climates have much heavier thyroids in proportion to their body-weight
. In Great
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lds for New
the July-
the face of cold weather is the probable explanation. In England, January is the most fatal month for those with heart disease or respiratory infections. He was sure that most old people in winter would be the better for a grains 2 tablet of thyroid substance weekly. Heart disease, cancer, and apoplexy are the three main causes of death in old age, accounting between them for about half the total deaths. While the general death-rate has slightly fallen in the last ten years, deaths from these three have increased, and deaths from senile heart disease have risen by nearly 50%—an increase greater than can be accounted for by the rise in average age of the population. Within living memory curative and preventive medicine have lengthened human life by ten years, and the limit has probably not yet been reached. Osler believed that endocarditis, whether simple or malignant, is nearly always an accident in the course of an infective process—a view
the existence of a previous
According to Osler endocardi
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Mr. Handley said he had been able to demonstrate chronic lymphangitis in precancerous areas, leading to thrombosis and blocking of lymphatics. He thinks it likely that the vascular or lymphatic thrombosis which causes more than half the deaths in old age is due to a single cause—not to the wearing out of the bodily machinery, but to the staphylococcus, the common organism
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for a green old age is to maintain bodily and mental activity at a reasonably reduced level, take a gr. 2 tablet of thyroid substance weekly, and maintain staphylococcal resistance by a monthly injection of minims 5 of weak '*Staph. Vaccord*' beginning at the age of 60—a treatment free from risk, which could be tried out experimentally.

Dr. S. L. SIMPSON felt that so much of Mr. Handley's view was unacceptable to conventional medicine that most of it must be correct. He thought it improbable, however, that thyroid deficiency was the basis of the endocrine or other changes of old age. Although the dose of thyroid suggested was small, and perhaps not likely to do harm, the high incidence of heart disease in old age must be borne in mind. Thyroidectomy has been used successfully in cases of angina and myocardial insufficiency, which suggests, he thinks, that if thyroid is given it may cause either myocardial or anginal symptoms to recur.

Dr. HOPE GOSSE contested Mr. Handley's statistics. In his view cardiovascular degeneration is a law of nature. Even if penicillin robs infections such as pneumonia of their importance as causes of death in old age cardiovascular degeneration of unknown ætiology will continue to operate.—Sir HENRY TIDY suggested that Mr. Handley's figures reflected no real increase in these causes of death, but—certainly in the case of cancer—merely the increasing age of the population. He remarked that a man is said to arrive at his highest intellectual ability at 37—the age at which Shakespeare wrote *Hamlet*—and to hold it until the age of 50, the ideal age for retirement. At 50 it is possible to take up some new interest—a much more difficult task in the sixties.

Sir JAMES WALTON doubted whether operations for rejuvenescence were justifiable. What is the use of keeping people alive, he asked, if they only live on in misery? However, he thinks there is no real need for older people to lose their intellect or bodily strength: by using their will power they can keep mind and muscle in good shape. "God forbid," he ended piously, "that I should ever have anything to do with any of these endocrines!"—Dr. W. G. OAKLEY challenged him at once: if diabetic, would he really refuse insulin? In diabetes, Dr. Oakley pointed out, deaths from cardiovascular disease at an early age were at one time extremely common, but now coronary thrombosis in young diabetics has almost disappeared. This, he felt, suggests that cardiovascular degeneration is not an inevitable event about which nothing can be done.

Mr. DICKSON WRIGHT mentioned many instances of extreme mental vigour in old age, particularly, as it happened, among Dublin doctors.—The PRESIDENT remarked that those who failed to maintain their activity in age by force of will-power [illegible] themselves with Browning's line: "Grow [illegible] me! The best is yet to be."

Reviews of Books

Small Community Hospitals

HENRY J. SOUTHMAYD, director of the division of rural hospitals of the Commonwealth Fund; GEDDES SMITH, associate of the fund. (Oxford University Press. Pp. 182. 11*s.* 6*d.*)

THE Commonwealth Fund of America has, since 1927, helped in the planning [illegible] small hospitals, of about 50 beds each, [illegible] practitioners, to serve rural areas. This book, which we mentioned in a leading article on May 12, sets out what has been learnt from the experience.

In Great Britain there are few places where an area of 50 miles' radius could be served by a hospital of 50 beds, and American conditions and practices differ from ours in a number of other ways. But the question how general practitioners should work together, how they should be related to hospitals, and whether health centres should have beds or not, and what part small hospitals are to play in the future health service—all these are very much with us. The personal relationship between doctors, on which so much else depends, is well and frankly discussed, particularly in a chapter entitled the Medical Team, which has an application wider than the 50-bedded hospital. It becomes clear, in fact, that difficulties of cooperation between doctors are much the same whether in urban or rural areas, in America or England. It is perhaps easier by way of introduction to contemplate dispassionately the problem 2000 miles away than the one on one's own doorstep.

The discussion of organisation, finance, building, and equipment is realistic and stimulating, and aims at a high standard. How many of us planning a hospital of 50 beds in this country would dare to propose the appointment of a "record librarian" (as opposed to a "girl to do the medical notes") and insist on her having been trained for the job? "A good record librarian may do more to raise the level of medical care than a new operating room."

A Textbook of Pathology

R. A. MOORE, professor of pathology, Washington University, Saint Louis. (Saunders. Pp. 1338. 60*s.*)

THIS book has much to commend it. The student is treated as an intelligent adult, and maps, photographs of patients, and X-ray photographs are well chosen to [illegible] his knowledge. Arrangement follows disturbances of metabolism rather than anatomical types of degeneration, and in the section dealing with special pathology diseases with similar causes have been classed together. Bacterial infections are grouped according to the sources and the portal of entry of the various organisms. The book includes chapters on diseases of the teeth, those caused by radiant energy, and injuries produced by miscellaneous invertebrates [illegible] Subjects of such topical interest as [illegible] betes, the Rh factor, and blast [illegible]. There are a few inaccuracies and perhaps some subjects are unduly simplified; but in the main the writing is clear and the information accurate.

The Reticulo-Endothelial System in Sulfonamide Activity

F. T. MAHER, PH D, assistant professor of pharmacology [illegible] ersity of Illinois. (University [illegible] $2.50.)

THIS monograph was begun in 1938 [illegible] in 1941 as a dissertation for the de[illegible] philosophy in the University of Illinois. It is a pity that publication has been delayed so long, since in such a rapidly developing subject particular series of experiments quickly become obsolete. Clinical response to sulphonamide therapy depends on the defence mechanisms of the host as well as on the bacteriostatic action of the drug, but before 1941 the contribution of the host had been rather overlooked. The normal defence mechanisms of laboratory animals cannot cope with the infections usually employed in studies of sulphonamides; and the bacteriostatic action of sulphonamides in vitro is only moderate. Professor Maher therefore felt that the effect of sulphonamides in laboratory animals was too dramatic to be merely the sum of these two factors. In normal rabbits receiving sulphanilamide, 75–90% of the drug present in the blood and urine was found to be in the conjugated form; in man, the maximum proportion conjugated is about 70%. If the reticulo-endothelial sys[illegible] by thorotrast, the proportion of [illegible] conjugated is greatly depressed. This suggests that much of the conjugation (possibly acetylation) of sulphanilamide takes place in the reticulo-endothelial cells. Rabbits are normally susceptible to infection by certain strains of *Staphylococcus aureus*, but can be protected by sulphathiazole. In rabbits with reticulo-endothelial blockade, this protection by sulphathiazole is absent: so the therapeutic effect of sulphonamides in vivo depends largely on an intact reticulo-endothelial system. The force of this demonstration, however, is weakened by the fact that rabbits with the reticulo-endothelial system blockaded are more susceptible to staphylococcal infections than ordinary rabbits are. Professor Maher emphasises the need for careful design of experiments on RES blockade and for caution in interpretation, but his thesis and results might have been made known to the medical and scientific world more economically in a paper to one of the scientific journals.

Technic of Electrotherapy and its Physical and Physiological Basis

STAFFORD L. OSBORNE, PH D, assistant professor of physical therapy North Western University; HAROLD J. HOLMQUEST, BS, lecturer in applied physics in the University. (Baillière. Pp. 780. 41*s.*)

THE material in this textbook is presented, during their course of physiotherapy, to the physicians, medical students, and technicians at North Western University medical school, Chicago, and aims to provide a sound physical and physiological background for the technique and application of electrotherapy. It is divided into four parts, dealing with the effects and technical application of direct current, electrical muscle stimulation, radiation, and high-frequency currents. One a physiologist and the other a physicist, the authors present the electrotherapeutic aspects of physical medicine thoroughly, accurately, and in a scientific manner. They insist on the need for correct and detailed prescriptions. The book should serve as a good textbook for those studying for the new diploma of physical medicine, and should also be a useful reference book later.

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1. Della Vida and Dyke (1942) Lancet 2. 275. Riddle (1940) Amer. J. med. Sci. 200.145. Isaacs et al. (1938) J. Amer. med. Ass. 111.2291
2. Minot et al. (1928) Amer. J. med. Sci. 175. 599.

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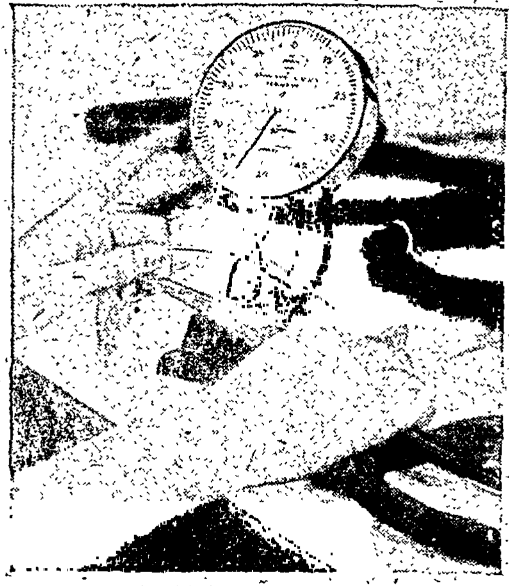

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THE LANCET

LONDON: SATURDAY, MAY 19, 1945

Return to Civil Life

THE returned fighting man, especially if disabled by his wounds, has always been an awkward character to fit into the civil pattern. WILLARD WALLER[1] reminds us of the obscure frustrations which cause such a man to see his home and country with anger and disillusion. Through his years of fighting he has had to subordinate his natural aggression to the discipline of his

hardships he has borne. Somebody or something, he feels, must be responsible for the mud and the blood, the death and the hunger. Whatever it is, he is ready to hate it, and his anger can surge up in a moment, destroying his judgment. He seems to see much to hate. If they have been safe, the people at home seem smug; if they too have known hardships and dangers, they have the less regard for his. In any case they are apt to fuss about nothing, he thinks, remembering men who held their tongues about disasters. Worst of all, he sees those who have stayed in safety advancing successfully in their callings, while he may have difficulty in finding work. If he is disabled his resentment may go even deeper; do what he will, he cannot escape some feeling of inferiority, for which he compensates by various devices.[2] He may show resignation, depression, anxiety, defiance, or a protective cheerfulness. Like other returned fighting men, and especially those who have long been prisoners-of-war, he may be prone to aggressive outbursts on little or no provocation. To his family he may seem a changed man—touchy, dictatorial, suspicious of affront, quick-tempered to the point of cruelty yet intolerant of retaliation, expecting steady affection yet seemingly bent on destroying it.

These characteristics of the returned fighting man are nowadays classed—perhaps too glibly—as symptoms, the outcome of his strenuous experience. Given time, patient and loving endurance from his family, and an opportunity to resume his place as a responsible wage-earner, he shakes them off; becomes able, as WALLER puts it, to live again in a society where consent, not command, is the currency. This may be looked on either as the resolution of a mental illness, or as an orderly readjustment of values to a changed environment. The soldier himself, however, like one of our Service correspondents,[3] may fairly complain that he finds symptoms of mental imbalance in the civil population—that they show a pathological indifference to the world at large, a morbid preoccupation with the trivial. His adventures have been dreadful but enlarging; his family have often had the

ave been

whittled

idents of

his sickroom, they are capable of feeling strongly about a blown fuse or the disposal of an old tin. Probably no-one is quite free of symptoms after a war. Both the veteran and his family must learn afresh to live together among the normal opportunities of peace.

It is something that we now recognise this and that attempts are being made to help returned Service men and women to settle less painfully into civil life than their fathers did. The Fighting Services have planned pre-release training, and the Ministry of Labour and National Service have a scheme for placing men and women in civilian occupations and for training those who need it. These schemes are set out in a book on release and resettlement which is being issued to every member of the Forces and are discussed in a pamphlet lately published by the Industrial Welfare Society.[4] The Army is offering a choice of courses, in technology, general science, home health and hobbies, man and society, commerce and the professions, and arts and crafts; and besides this is setting up civil resettlement units for returned prisoners-of-war. These CRU camps will be scattered about the country in pleasant surroundings near towns, and a man who goes to one will naturally choose a camp near his home. Courses may run from four weeks to three months, but a man may leave whenever he chooses. He will sleep in a sprung bed with sheets, breakfast at 8 in a dining-room with small tables, and wear civilian clothes when not at work. The timetable will begin at 9 AM and end at 5 PM, and he can choose the classes he attends—visiting factory, technical school or training centre, handling tools in a workshop, attending a discussion or an instructive film show, or taking part in physical exercises or optional games. There will be no parades except the pay parade, and he can go home at weekends, or sleep out if he lives near. The Royal Air Force provides courses in citizenship and social problems and handicrafts, as well as educational and technical courses; and the Royal Navy has vocational and educational courses. All three Services are arranging talks and discussions on current affairs.

A Forces Preliminary Examination has been planned, of the standard of the School Certificate, for the benefit of those who hold no preliminary general qualification for entering the professions, and various professional bodies have agreed to consider applications for post-war training from those who pass this examination. The Ministry of Labour is setting up a resettlement advice service to help those who are at a loss when they return to civil life: offices will be established in all large towns, and the resettlement officers will be given special courses of training before taking up their duties. Finally, the Ministry is providing training courses at resettlement centres not only for those in the Fighting Services, but for all who have been prevented by war service from taking up a trade or who can no longer return to their previous occupation and need to learn a new one. Training will cover a period up to a year in a training centre or technical college, or in the training schools of private firms, many of which are arranging to run courses under an approved Government scheme. During training the man will be eligible for maintenance grants, and for marriage and family allowances.

It is well that the emphasis should be laid on training for a return to work. Experience both here and

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1. Veteran Comes Back. The Dryden Press, 1944. See *Lancet*, April 21, p. 504.
2. Wittkower, E. *Brit. med. J.* April 28, p. 587.
3. *Lancet*, March 31, p. 413.
4. Plan for Reinstatement. Industrial Welfare Society, 14, Hobart Place, Westminster, London, SW1. Pp. 24. 1s.

in America[5] has shown that reinstatement in appropriate and properly paid work is the best sedative for the unstable mood of the fighting man. STALKER[6] in a Scottish study, found that of men boarded out of the Forces because of psychoneurosis, only 13% were unemployed six months after leaving the Services, as compared with 16·5% of men boarded out from all causes. A group of 64 suffering from anxiety neurosis, psychopathic states, hysteria, schizophrenia, and other conditions, presented unusual difficulties; yet nearly half of these were also successfully resettled in work.

Bronchopneumonia in Infants

IN pre-war London at least a fifth of the children who died under 2 years of age were certified as dying of bronchitis or pneumonia. Thus in the last three years before the war (1936–38) the annual death-rates for these children from all causes were 42·3, 36·4, and 34·8 per 1000, while the rates from bronchitis and all forms of pneumonia were 9·2, 8·4, and 7·4. Death certification in infants is unreliable—plain bronchitis is hard to accept as a cause of death—and some of these children no doubt died because they were wrongly fed; nevertheless the figures must still reveal a serious loss of young lives from pulmonary infections. Chemotherapy and other modern methods of treatment can reduce this loss of life, yet prevention must as usual be better than cure. But is it possible? Some day specific prophylactic measures may be devised against the diverse micro-organisms responsible for the primary respiratory infections; meanwhile we can seek out the environmental factors that predispose the infants to contract these illnesses and see whether they lend themselves to change. Such a study has been carried out in London by G. and H. PAYLING WRIGHT.[7]

In the 28 Metropolitan boroughs there are considerable and persistent differences in the mortality of infants from the causes which, for convenience, the WRIGHTS group together as bronchopneumonia. They had first satisfied themselves that the great majority of the deaths were, in fact, likely to have been from primary pneumonia and only a small proportion secondary to unnotified measles, whooping-cough, diphtheria, or influenza. Taking the 5 years 1929–33, they find that these differences in mortality are significantly associated with overcrowding, with the proportion of men employed in the lower-grade occupations, with the proportion of the population below the poverty line, and with the number of young children per family. The disease shows a closer association with the social indices—low-grade employment and poverty—than the same observers found when they studied measles and whooping-cough.[8] They suggest that inadequate means for buying food, clothing, and fuel may therefore be of greater consequence in causing deaths from bronchopneumonia than from these two acute specific fevers. This point is related to the striking association between deaths from bronchopneumonia and low external temperatures. The seasonal variation is remarkably constant year by year, affects the young as well as the old, and appears in the urban and rural areas surrounding London as well as in the central boroughs. The factors responsible for this variation, whatever they may be, are thus operating in much the same way on persons of very different ages and livi under widely differing hygienic lating weekly mortality with the mean temperatur of the coldest day of the week, over the years 1923–3 the closest association is found between the death-rat and the temperature 12–14 days earlier; in bot infants and elderly persons the deaths rise rapidl when the mean daily temperature for the coldes day falls below 40° F. Ignorance, too, a clos associate of poverty, must play a large part i deciding the distribution of infant deaths from pneumonia, especially where starvation from bad feedin precedes the lung infection.

Thus there are two distinct aspects of the proble of bronchopneumonia in London infants—the socia and environmental factors that lead to the pronounce differences between the boroughs, and the constan winter exacerbations recorded for the city as a whol The former are difficult, if not impossible, to disentangle. Is the association with substandard housin due directly to the closer physical proximity of persons in overcrowded areas, or is overcrowding merel an index of poverty and its accompaniments The WRIGHTS suspect that overcrowding contribute directly to the incidence by allowing greater opportunities for the spread of the organisms; but fatality apart from incidence, might be appreciably affecte by the poverty factors. Housing improvement alone would not solve the problem, since the mea mortality for the 28 boroughs in 1929–33 was 9·9 per 1000, and if all the boroughs were brought up t the standard of the six best-housed ones it would fal only to 6·80.

The rather scanty observations available mak it improbable that the winter epidemics can b entirely ascribed to a rise in the carrier-rates for th relevant organisms, either in the community generall or at the two extremes of life. There is still les evidence of any seasonal variations in bacteria virulence, but seasonal changes in host susceptibilit might take the form of a general deterioration i humoral and cellular immunological reactions o a failure of specific defence mechanisms at som portal of entry. The WRIGHTS point out that there is no indication that low temperatures in the spring are associated with higher death-rates than the same temperatures in the autumn, which does not support the supposition that susceptibility increases during the winter because the body becomes deficient in protective nutrient substances. They also note that there is little, if any, seasonal variation in the mortality from—and thus presumably in the resistance offered to—acute staphylococcal and streptococcal infections such as infective endocarditis, puerperal sepsis, carbuncle, and osteomyelitis. From autopsy studies A. B. ROSHER[9] concluded that while the nasopharyngeal carrier-rate of Pfeiffer's bacillus remained fairly steady there was a tendency in late winter and early spring for the organisms to spread downwards into the lower respiratory tract. Similarly the WRIGHTS favour the view that in winter adverse weather conditions, particularly in infants with their incompletely developed control of body temperature, permit bacteria that are normal inhabitants of the nasopharynx to gain access to the smaller bronchi and bronchioles. They maintain that improved social conditions will certainly lower mortality, but that other steps should be taken to expedite that end. The most hopeful seem to be educative measures to ensure that infants are better protected against chilling and exposure, and full use of the effective means of treatment now to our hand.

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[5] Andrews, J. N. Readjusting the Veteran. Industrial Hygiene Foundation, Pittsburgh, 1945.

[6] Stalker, H. *Brit. J. Phys. Med. indust. Hyg.* Jan.-Feb., 1945.

[7] *J. Hyg., Camb.* 1945, 44, 15.

[8] *Ibid*, 1942, 42, 451.

[9] *Rep. publ. Hlth med. Subj., Lond.* 1939, no. 90.

Too Ill to go to Hospital

DURING the early years of the century the medical and nursing professions did much to break down the old prejudice against going into hospital. "They get you in there to die" . . . "They experiment on you"—these old bogies were patiently and rightly laid, for in those days our nursing profession was fully-manned and the finest in the world, and our doctors were not grossly overworked. We could truthfully say, then, "You will be better cared for in hospital than you are at home. You will be surrounded by people who are out to get you well, and who are properly trained to do it." If such statements are nowadays made with more reservations the reason may be that our standards have risen or that hospitals are not quite what they were. It is perhaps significant that distrust is now encountered chiefly among the educated and critical. Even members of our own profession sometimes have qualms when a sick relative, especially a child, is advised to go to hospital. Are the advantages of hospital treatment, they ask themselves, certainly greater than the disadvantages of the hospital environment?

In our correspondence columns this week Countess RUSSELL gives an example—unfortunately not unique—of the kind of treatment we dread on behalf of our kin and friends. She was naturally unwilling to let her sick child leave her own care, but she was persuaded to do what she thought was for his good. From the moment of his admission to a local cottage hospital the child, according to ordinary standards of home nursing, was neglected. He was left thirsty when he needed free fluids. His medicine was not ordered, and would not have been given if his mother had not given it herself. He was left without a nurse when he was delirious and getting out of bed. When his mother had be[illegible] judgment, to leave him, he [illegible] by a silly threat, but also, [illegible] elementary principles of nursery psychology, deprived of the toy (to him a personage) which was his last link with the security of home. Of course it is easy to find explanations for all this mishandling. The doctors were not, at the outset, certain of the diagnosis, and they may have withheld treatment on principle. The hospital was almost certainly short of nurses; being small, it would probably not attract nurses of the highest quality; and the nurse appointed to look after the child at night was perhaps young and inexperienced, and very likely overtired. In times of great stress we are not always good judges of the behaviour of others, and it is possible that the staff of the hospital seemed careless and callous when in fact they were well-meaning but harassed. But to explain such failures is not to excuse them; and in any case the purely physical neglect cannot be extenuated. If we undertake to give a patient proper care in hospital, and then subject him to a succession of physical and psychological injuries—each small in itself perhaps, but, in the sum, damaging to both his peace of mind and his chances of recovery—then we are neither better nor worse than a local authority which places a neglected child in a bad foster home. In dealing with the sick, as with neglected children, it is not enough to mean well.

The deterioration of nursing care in some of our hospitals can partly be attributed to the demands of war; we need more nurses than ever, and we have fewer young women to draw them from. But it had begun before the war years, and springs, at least in part, from complacency with things as they are. Having achieved a high level of responsibility in our best hospitals we should have been content with nothing less in any. Our rapidly growing nursing service should have been planned to attract, and keep, the best type of nurse. We have been willing to accept lower standards from time to time in the hope that the example of the best hospitals would presently raise the rest to their level. But hospitals are for the most part separate autonomies, pursuing their own affairs, like single islands in an archipelago; they have not enough opportunity to learn from each other; and when times got harder and nurses scarcer each made its own compromises, some good, more bad. Short staffing means short tempers, and the nurse who is giving extra service against her will cannot feel normally sympathetic towards her patients; far less can she develop that keen perception of his needs and desires which distinguishes the good nurse. We cannot recover a right spirit in our hospitals until we have revived a right spirit throughout the nursing profession.

Doctors are equally in need of fresh inspiration. The days when a man could choose how much work he would do are gone, probably for ever. He has not the leisure, as in the good old days of LUKE FILDES, to sit and gaze on the face of a sick child. But he should always have time and imagination enough to put himself in the place of the child and its mother, and to ease the strain on them as far as he can. If anxious relatives are inclined to see offence where none is meant, there is all the more reason to study not to offend them. To indulge a reputation for a plain blunt manner cannot be justified at a time when a mother fears for her child's life. Fatigue and hurry are the doctor's enemies today: he can defeat them only if he is consciously and constantly on his guard against their guerrilla tactics.

Perhaps the most regrettable part of Countess RUSSELL's story is the change in manner which she experienced when her name became known. Hospital patients sometimes complain that they are treated casually or even rudely merely because they are poor and insignificant; and it is disquieting to find their opinion supported in this instance from another angle. The presence of the mother overnight in the hospital no doubt disconcerted the staff, and perhaps put them in the mood to think her a busybody; but in fact she had the determination to do what every parent would prefer to do on such an occasion. The fault lies in the assumption that once a child is admitted to hospital he ceases to belong to his parents and becomes the property of the nursing staff. There are of course some mothers and some children whom it is better to separate when the child is ill, because the child is alarmed by the mother's visible anxiety or because he may suffer through friction between the mother and the nurse. Sometimes, on the other hand, a child ill enough to need the special equipment of a hospital is not fit to bear the added strain of parting from his mother. To decide which is best for the child, like much else in medicine, calls for judgment and discrimination; but the hospital should always be able to arrange for the mother to stay in comfort if she is needed, and the existing rule —only relaxed when the child is dangerously ill, or for the socially important and well-to-do—should become much more flexible.

It has been suggested that one member of the staff, possibly from the almoner's department, should be appointed as receptionist to look after relatives of patients and to see that they get food and rest while they are waiting. This would have the merit of turning nobody's business into somebody's business. It might be valuable for student nurses to share in this task for a time during training: they would gain such insight into human anxiety as would not easily be forgotten. Medical students might undertake the same duty with advantage, learning from it that expensive equipment, advancing methods in theatre and laboratory, and a growing understanding of disease cannot compensate the sick man or his family for the kindness, comfort, and attention which alone make serious illness bearable. FLORENCE NIGHTINGALE knew that these must be given mainly by women who had a real interest in the care of the sick; and we might begin again exactly where she did, by attracting the right women to nursing and allowing them to love their work.

Annotations

THE WORLD'S FOOD

WHEN the Hot Springs Conference dispersed some two years since, it took the precaution of leaving behind it an interim commission whose business was to survive until a permanent Food and Agriculture Organisation emerged. The task of this commission, we are told, is near its close; for the draft constitution of the new organisation, known as FAO, will soon have the assent of twenty nations which is required to bring it into action.

National sovereignty is to remain a feature of the post-war world: so it seems there can be no world government in this matter of feeding the world's people; and if there is a world conscience it will presumably have to be embodied, as it will in the matter of peace, in the preparedness of three or four great nations to make it work. One may liken the situation to a prospective game of cards. The tables, chairs, packs, and shaded lights are all before us; and the rules of the game are susceptible of any measure of refinement and elaboration we care to give them. But how many of the players will participate, and for how long?

The designers of this constitution know what they are about. Clearly they discern that they are a part of the new world order and not its whole. There must be peace, and therefore an organisation for the maintenance of peace; there must be credits, and therefore an authority for the provision of credits on liberal terms. As far as food and farming are concerned, the nations must agree. But to what? A little is indicated; more is hinted or foreshadowed. Will the nations agree, for example, on a regulated and equitable price in the world markets for wheat, sugar, and cotton? It would be well if they do so; but it would be far from well if they do so on the basis of high cost and inefficient methods of farming and transport. Shall a backward country be granted credits for the reorganisation of its agriculture? It is reasonable to suggest that in that case the advance should be conditional on the acceptance of expert advice and direction. Shall we try to remove fo[illegible] the producing areas before they have [illegible] world prices against the farmer? If we do so, it is incumbent on us to find a market for them wherever there is need or hunger; and our only course is that of marketing the surplus at the price the malnourished consumer can pay.

But these are no more than the refinements to which the rules of this complicated game are susceptible. So far we have only the tables and the lights and the cards. There lies implicit in the scheme the problem whether the protective foods should be made as freely available to the pregnant women of Ceylon or Burma as they are to those of South Wales. There is nothing to prevent us from transporting to Lincolnshire, for the purposes of our national milk scheme, milk produced in the West Riding. Precisely then what are the problems of currency, of costs, of national sovereignty, of commercial morality, that prevent us from shipping dried milk from Canada for the benefit of pregnant women in Morocco? This surely is the core of the whole matter. Already in American writings one may see speculation on the possibility of a "food stamp plan" of international dimensions; and if that is in truth the trend of transatlantic thought, we may for the moment be content that the world's conscience should rest in American keeping.

SURGERY OF THE PATENT DUCTUS

A SURGICAL approach to the treatment of patent ductus arteriosus was first suggested about forty years ago,[1] but it was not until 1939 that the first successful ligation of an uninfected ductus was reported in America.[2] In England in the same year Tubbs[3] successfully closed an infected ductus. By 1943 Shapiro and Keys[4] could record 140 cases, with highly satisfactory results: of the 107 non-infected cases, ligation had been completely successful in 81, and only 9 patients had died as a direct result of the operation; the results in the 33 infected cases were even more impressive—success had been attained in 20, with 5 deaths from the operation. In this issue Sellors reports 10 further cases of ligation without complications; 4 cases were operated on because of a superadded infective endarteritis, and 3 because of heart-failure; the remaining 3 patients showed signs of neither infection nor failure, but operation was undertaken to prevent such developments. Gilchrist[5] has lately recorded 14 cases submitted to operation; the 2 patients with bacterial endarteritis both died, and there were 2 other deaths among the non-infected cases, one due to hæmorrhage from a torn ductus and the other probably due to a deep-seated infection in the mediastinum. The 10 remaining patients have been followed for periods up to forty-five months after operation, and 6 have been able to lead full active lives. Of the 4 cases in which the postoperative improvement was less definite it is noteworthy that in 3 only partial obliteration of the ductus was obtained.

In selecting patients for operation Gilchrist looks on the patient's age and the degree of cardiac embarrassment as the two main factors. Where there is an infected patent ductus operation should be undertaken whatever the patient's age, and in deciding whether a bacterial endarteritis is present Gilchrist describes a radiological picture that is practically pathognomonic—prominence of the pulmonary artery, progressive enlarge-

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1. Munro, J. C. *Ann. Surg.* 1907, **46**, 335.
2. Gross, R. E., Hubbard, J. P. *J. Amer. med. Ass.* 1939, **112**, 729.
3. Bourne, G., Keele, K. D., Tubbs, O. S. *Lancet*, 1941, ii, 444.
4. Shapiro, M. J., Keys, A. *Amer. J. med. Sci.* 1943, **206**, 174.
5. Gilchrist, A. R. *Brit. Heart J.* 1945, **7**, 1.

ment of the heart, and varying patchy consolidation in the lungs. In cases of non-infected patent ductus age is of great importance in deciding on surgical intervention. Not only are children better subjects for thoracic surgery than adults, but the ductus is also more readily approached and dealt with in childhood than in later life. While not quite agreeing with Vedoya's view[6] that operation should be undertaken as early as possible in every case of patent ductus, Gilchrist suggests that in a child who has reached the age of nine or ten years and still has physical signs of a patent ductus, operation should be seriously considered, provided the child's progress has been carefully followed for six months and during this period there has been no evidence that the ductus is closing spontaneously. In the next decade ligation should be decided on only if the patient is definitely disabled, while over the age of twenty the operation should be considered only if heart-failure threatens or symptoms become very grave. Sellors adopts a more cautious attitude in patients without either infection or heart-failure, pointing out that the operation is not without risk. He also urges the need for making certain before operation is performed that the patency of the ductus is not compensating for other congenital lesions in the heart.

With increasing care in the selection of cases, and improvements in surgical technique, it should be possible for a large proportion of patients with patent ductus arteriosus to live to old age. It is in congenital abnormalities such as this that there will always be a sphere for the skilled surgeon, for no amount of medical care can bring about a cure.

GENERAL PRACTICE A SPECIALTY?

Mr. Douglas Robb, writing as a New Zealand surgeon with experience of many kinds of general practice, thinks that too much is being demanded of the general practitioner.[7] His rôle has always been personal: he "must retain intimate contact with his patients under all circumstances, particularly in their homes and in their work. He must become interested in and adept at studying human personality at all ages and under all conditions." Today people still need the help that general practitioners of the past gave them: "it is by far the largest single need that the people have of us." But a great extra burden has been placed on the practitioner in expecting him, in addition, to possess such a mind and character that he can work effectively under the discipline of modern science, and with the accoutrements of the laboratory.

> "Without in any way decrying the value and necessity of the scientific method in the field of general practice, the [illegible] spect good performance in these [illegible] Apparent simultaneous success [illegible] and special practice is usually attained only at the expense of increasing failure in one or other or both of the two fields. If a man is interested and determined to succeed as a specialist in the scientific world of medicine, it is usually found that he has lost interest in the truly general practice which he is supposed to be doing. Conversely, if he throws himself heart and soul into the general practice and 'pastoral' care of his patients, he will not be able to succeed as well as modern conditions demand that he should in a special field."

In New Zealand, where town populations are generally small, the general practitioner has been especially encouraged to practise one or more specialties besides doing his natural work: indeed this is claimed as an admirable feature of New Zealand medicine. The same tendency is also seen of course in England, where it is widely felt that each practitioner should develop one or more minor specialties—to keep up his interest and enable him to take his share in the practice of a group. But Mr. Robb, while not denying the force of these achievements in his own country, believes that both fields have suffered exceedingly by them: the general practice has been neglected, and the specialist work has been much below what it should have been. The time has come, he says, to create good circumstances for both fields. "The general practitioner must by training and experience and facilities be as much a specialist at his own job as the man who is recognised as a specialist today."

A year ago Dr. Frank Gray[8] was preaching the same gospel, objecting strongly to the proposal to improve general practice by attaching practitioners to hospitals by clinical assistantship and other devices. General practice, said Gray, is a specialty, and the hallmark of a specialty is a higher degree or diploma: "therefore what we need is a higher diploma in general practice." This he suggested should be comparable to the final FRCS "both in difficulty and in the stage of a doctor's career at which it would be taken (after a period of experience in general practice, probably at least two years)." Candidates should, he thought, attain a high standard in all the subjects of some such schedule as the following:

- (a) Diagnosis and treatment of all minor maladies.
- (b) The preventive aspect—for the individual—of all diseases.
- (c) Diet, clothing, and individual hygiene generally.
- (d) Antenatal care and infant welfare.
- (e) Minor psychological conditions, including those found in patients with organic disease.
- (f) Certain other subjects not adequately covered in the undergraduate course—probably including pædiatrics and dermatology.
- (g) Methods of research in general practice.

Robb, in commending this plan, points out that the positions of the practitioner and specialist today are largely based on economic considerations. General practice brings the quickest and greatest return for the least capital, provided one is prepared to work. The life of the specialist is attractive by contrast, for it allows a man to keep up his medical study and cultural interests, but it can be achieved only through private resources, late marriage, superior intellectual powers, or sheer determination.

> "Present arrangements, it is true, have been eminently successful as a device for getting the dull, routine, repetitious medical work of the community done with a minimum of personnel. Whether it be the high rewards, or the particular system of rewards, namely payment for each individual act, the fact remains that incredible labours have been forthcoming from the majority of medical men. The price, however, has been equally terrific. It has prevented almost every one of us from taking a detached view of ourselves and our work and our place in society. The pathetic performance we often put up when we meet in groups of varying sizes to discuss affairs of state is a trenchant commentary. We are apt to view each problem as it arises pretty much through our own individual pair of spectacles. Overwork has cramped our power of thought and discussion and dulled our social conscience."

Robb holds that in the future organisation of medicine economic considerations should be secondary: we should [illegible] it branches of medicin[illegible] the peculiar scope a[illegible] that of other specialties, and the rewards and status of each branch should be thought of as more or less equal, "on the sure ground of the human needs of those rendering the service." Nor, in Robb's opinion, need the equality be on a low level; for, if he only knew it, man has won his struggle for subsistence. The war has heaped examples on us of the stupendous powers we possess to provide the necessities and luxuries needed by human beings:

> "The time has come when we can all take for granted all we need of these necessities and luxuries. We may all now turn aside from this 'struggle for hogwash,' and devote

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6. Vedoya, R. et al. *Revist. argent. Card.* 1942, 9, 791.
7. *N.Z. med. J.* 1944, 43, 248.
8. *Brit. med. J.* 1944, i (Suppl. p. 121).

Reconstruction

A COMPREHENSIVE SERVICE BY NEXT JANUARY?

On May 5 the *Times* published a letter from Dr. Haden Guest, MP, asking for early decisions on the structure of the national medical service. Regretting the "undue prolongation" of negotiations between the Government and the profession, he put forward a compromise plan which would bypass much of the discussion and could be brought into action quickly. His proposals are:

(1) An immediate statement by the Government that the national medical scheme is to provide for 100% of the population irrespective of income.

(2) That the Government will bring into operation a domiciliary service covering the whole country, and provide that every citizen shall have the right to free home treatment and free treatment at a doctor's consulting-room from that date.

(3) [illegible] in which voluntary and publicly owned hospitals work as one body, and have so admirably provided for the Services since the war began.

(4) That the Government will provide a free service of consultants and specialists, and a free service of pathological, X-ray, and other auxiliary services from the same date.

(5) That these services will operate from Jan. 1, 1946.

He goes on to say that demobilised doctors wishing to take up general practice could be immediately appointed to under-doctored areas, while those wishing to work in hospitals could be appointed to the EMS. As regards administration, the whole organisation could be placed, for the time being, under the control of the EMS and the Ministry of Health, and the country could be provided with a comprehensive medical service by the beginning of next year.

This plan deserves examination as a sincere attempt [illegible] rliament to find a way to [illegible] f the comprehensive health [illegible] been promised. Dr. Guest approaches the problem from the standpoint of the men who will shortly be returning from the war, and postulates two principles with which we can all agree: (1) that the demobilised soldier must be sure that he and his family will always be able to obtain all proper medical care, and (2) that the demobilised doctor must be assisted to find and fill his own particular place in the medical service of the future. Being impatient of the slow progress of present negotiations, he offers instead a gordian solution. We have to ask whether his plan is practicable and acceptable.

THE HOSPITALS SERVICE

Of the five proposals the first two, half the third, and the whole of the fourth, are already implicit in the white-paper, and as such have been accepted by Parliament, press, and—perhaps more reluctantly—by majority medical opinion. Dr. Guest only becomes controversial when he suggests how and when these "fundamentals" shall be implemented.

The second half of his third proposal suggests that the hospital services shall be provided by continuing the war-time emergency medical service. As a short-term policy, to last until something better can be evolved to suit peace-time needs, this proposal is attractive. The flow of air-raid and battle casualties into the hospitals of this country will now cease, and the beds released might suffice, at least at first, to cater for civilian needs. But the basis of the EMS is that the Government pays hospitals the whole cost of such beds as they provide for certain Government purposes. If these purposes became nothing less than a hospital service for the whole population, the extension would mean putting on to central government funds (and inevitably on to central government control) the whole accommodation of all hospitals, voluntary and municipal. Quite apart from whether the voluntary hospitals would face such a prospect with equanimity, this would mean removing from local authorities the whole of their present financial and therefore administrative, responsibility for hospital services; and, as a 100% hospital service would have to cover tuberculosis, infectious diseases, maternity, &c., it would also involve the removal of those services, or at least their centralisation to a high degree. These are the very problems of a 100% hospital service which are being worked out with the voluntary hospitals and local authorities now. Simply to centralise all the hospital services by universalising the EMS would, we fear, provide no solution. The moment the EMS became a 100% service its whole nature would change and it would throw up precisely the problems which the National Health Service has thrown up.

GENERAL PRACTICE

When Dr. Guest turns to the larger question of a nationally provided general-practitioner service, he also seems to simplify it too much. The Government are seeking not only a practicable way of providing such a service, but also one which could be received with good will by the doctors who will have to operate it. His plan for general practice could not, in our view, be carried through at present, and would at any time be unacceptable to very many general practitioners.

As he would be the first to agree, general practitioners at present in practice, overworked and depleted in numbers, are too few to meet current demands, let alone the increased calls which we hope and expect will be made on their services as soon as all financial barriers between doctor and patient are removed. The Education Act has decreed a non-domiciliary service of free medical treatment for school-children, but many an education authority is finding it virtually impossible to fulfil its statutory duty to the children, because of the shortage of doctors. To believe that a satisfactory free domiciliary service for all men, women, and children, could be instituted by decree on Jan. 1 next, without greatly increasing the number of doctors, or increasing their potential capability for efficient medical work by organising group practice with its auxiliary nursing and secretarial assistance, is surely to evade reality.

Apart from this, we believe Dr. Guest's suggestions to be unacceptable to a great many doctors, because inherent in them (if we read him aright) are two principles which the profession has largely rejected. One is the "direction" of demobilised doctors to practise in specified areas: the other is their "appointment"—presumably their salaried appointment—to general practice.

Finally, beyond saying that this general-practitioner service shall be "under the control of the EMS and the Ministry of Health" Dr. Guest does not indicate how the administrative structure should be built, through which the general-practitioner service would function. The foundations must be secure if the future structure of such a service is to be satisfactory, and this is the reason why so much time has been spent in exploring the ways in which it will be possible for expert medical advice to be heard, and not to go unheeded, at all stages in its fashioning and fulfilment.

We are at one with Dr. Guest in deprecating "undue prolongation of Government and medical negotiations," but we believe the best way to meet the needs of the men and women about to be demobilised is not to look for a bypass or short cut but rather to expedite the work in progress, which has already gone a long way. As soon as possible the Government's plans should be put to the crucial test of parliamentary debate, and the "appointed day" for statutory implementation should be made as early as is practicable.

Reconstruction

A COMPREHENSIVE SERVICE BY NEXT JANUARY?

ON May 5 the [illegible] GUEST, MP, aski[illegible] he national m[illegible] prolongation " of negotiations between the Government and the profession, he put forward a compromise plan which would bypass much of the discussion and could be brought into action quickly. His proposals are:

(1) An immediate statement by the Government that the national medical scheme is to provide for 100% of the population irrespective of income.

(2) T[illegible] bring into operation a domi[illegible] whole country, and provide [illegible] the right to free home treatment and free treatment at a doctor's consulting-room from that date.

(3) That the Government will [illegible] hospital treatment for all [illegible] for that purpose continue [illegible] in which voluntary and [illegible] as one body, and have so admirably provided for the Services since the war began

(4) That the Government will provide a free service of consultants and specialists, and a free service of pathological, X-ray, and other auxiliary services from the same date.

(5) That these services will operate from Jan. 1, 1946

He goes on to say that demobilised doctors wishing to take up general practice could be immediately appointed to under-doctored areas, while those wishing to work in hospitals could be appointed to the EMS. As regards administration, the whole organisation could be placed, for the time being, under the control of the EMS and the Ministry of Health, and the country could be provided with a comprehensive medical service by the beginning of next year.

This plan deserves examination as a sincere attempt by a medical Member of Parliament to find a way to expedite the establishment of the comprehensive health service which the country has been promised. Dr. Guest approaches the problem from the standpoint of the men who will shortly be returning from the war, and postulates two principles with which we can all agree: (1) that the demobilised soldier must be sure that he and his family will always be able to obtain all proper medical care, and (2) that the demobilised doctor must be assisted to find and fill his own particular place in the medical service of the future. Being impatient of the slow progress of present negotiations, he offers instead a gordian solution. We have to ask whether his plan is practicable and acceptable.

THE HOSPITALS SERVICE

Of the five proposals the first two, half the third, and the whole of the fourth, are already implicit in the white-paper, and as such have been accepted by Parliament, press, and—perhaps more reluctantly—by majority medical opinion. Dr. Guest only becomes controversial when he suggests how and when these "fundamentals" shall be implemented.

The second half of his third proposal suggests that the hospital services shall be provided by continuing the war-time emergency medical service As a short-term policy, to last until something better can be evolved to suit peace-time needs, this proposal is attractive. The flow of air-raid and battle casualties into the hospitals of this country will now cease, and the beds released might suffice, at least at first, to cater for civilian needs. But the basis of the EMS is that the Government pays hospitals the whole cost of such beds as they provide for certain Government purposes. If these purposes became nothing less than a hospital service for the whole population, the extension would mean putting on to central government funds (and inevitably on to central government control) the whole accommodation of all hospitals, voluntary and municipal. Quite apart from whether the voluntary hospitals would face such a prospect with equanimity, this would mean removing from local authorities the whole of their present financial, and therefore administrative, responsibility for hospital services; and, as a 100% hospital service would have to cover tuberculosis, infectious diseases, maternity, &c., it would also involve the removal of those services, or at least their centralisation to a high degree. These are the very problems of a 100% hospital service which are being worked out with the voluntary hospitals and local authorities now. Simply to centralise all the hospital services by universalising the EMS would, we fear, provide no solution. The moment the EMS became a 100% service its whole nature would change and it would throw up precisely the problems which the National Health Service has thrown up.

GENERAL PRACTICE

When Dr. Guest turns to the larger question of a nationally provided general-practitioner service, he also seems to simplify it too much. The Government are seeking not only a practicable way of providing such a service, but also one which could be received with good will by the doctors who will have to operate it. His plan for general practice could not, in our view, be carried through at present, and would at any time be unacceptable to very many general practitioners.

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the same as under the old regulations though it will be
rs instead of five.
study has been enlarged
, as well as the English, chemistry, physics, and biology already required. In the new course chemistry and physics are major subjects in the first year, and chemistry and biology with psychology in the second year. English and either history or philosophy are required, as well as one of the following: anthropology, botany, a foreign language, history or philosophy if not already chosen, mathematics. Any option taken in the first year must be continued in the second. *It is thus possible for a student to select both* history and philosophy or to take one of these subjects with another selected from the list of options. The instruction in English and the optional subjects is to be equivalent to that given in corresponding honours courses in the faculty of arts.

A special concession has been made to men now in the Armed Forces who may wish to study medicine. For these a special premedical course of one year will be arranged, to be followed by the regular four years in medicine. These students will therefore graduate in five years instead of six.

ly typical of similar
in Canada having
of these instruction
stress the value of a
arts; most students in these schools have taken a bachelor's degree before entering the medical course. Emphasis is laid on the study of philosophy. Dalhousie, McGill, Queen's, Manitoba, and Alberta have entrance requirements like those of Toronto, and Western Ontario closely approximates to the others. This unanimity will affect other universities in Canada that may in the future undertake the teaching of medicine. All the schools now operating have to limit the number of students according to the laboratory accommodation at their disposal, and the output of graduates does not exceed the needs of the country in peace-time. The University of British Columbia is under strong pressure to form a medical faculty. Saskatchewan already gives the premedical *courses required by the other universities and* has long had plans for adding the facilities that would provide a full medical course. McMaster University in Hamilton, Ontario, could form a strong faculty should it decide to undertake the teaching of medicine. But this university is under Church control and those who wish to enlarge its scope with government assistance are in the minority.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED MAY 5

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1351; whooping-cough, 1050; diphtheria, 504; paratyphoid, 7; typhoid, 3; measles (excluding rubella), 13,139;
influenzal), 518;
puerperal
fever, 50; polio-
myelitis, 7
halitis lethargica,
1; dysentery, 100; ophthalmia neonatorum, 62. No case of cholera or plague was notified during the week.

itals
; the
48;

Deaths.—In 126 great towns there were no deaths from enteric fever, 1 (1) from scarlet fever, 12 (2) from measles, 5 (0) from whooping-cough, 9 (0) from diphtheria, 61 (8) from diarrhœa and enteritis under two years, and 10 (1) from influenza. The figures in parentheses are those for London itself.

Birmingham reported 6 deaths from diarrhœa and enteritis, Edmonton 5, and Reading 4.

The number of stillbirths notified during the week was 190 (corresponding to a rate of 20 per thousand total births), including 11 in London.

BRITISH ORTHOPÆDIC ASSOCIATION.—This association is meeting at Horton Emergency Hospital, Epsom, on Friday, June 1, and at Hill End (St. Bartholomew's) Hospital, St. Albans, on June 2.

CONTRIBUTION OF SCHOOL MEALS TO NUTRITION OF CHILDREN

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AT the request of the Ministry of Food a series of nutritional studies has been carried out in schools in Birmingham, Leeds, and Sur
years. The immediate object
to determine the nutritional v
provided and to assess their contribution to the total daily intake of food.

In each of the districts studied, the schools formed two

situated some distance from the school. In Surrey samples for analysis were taken from 8 schools representing both types. Similarly in Leeds the meals at 6 schools were investigated monthly for six months *in* 1913 *and in* July, 1911,
type
was studied
ools
were visited
the *selected schools were not exceptional.*

In Birmingham the meals served in schools with their own kitchens were directly controlled by the city Education Department, which arranged the menus and provided the raw materials required. The menus were worked out on a fortnightly rota and calculated to conform as far as possible to the standard for the school dinner set by the then Board of Education. This facilitated the Birmingham investigation, in that one school could be selected for study and a chemical analysis made of every meal served during a fortnight. Unfortunately it was not possible to do this in Leeds.

In all districts the dishes served were of the usual types—e.g., stew, shepherd's pie, fish pie, meat and vegetables, steamed puddings, rice pudding, tarts, and stewed fruit. In some instances there was difficulty in the supply of fresh green vegetables but these were served whenever possible. Raw salads were served in all districts. In Birmingham salads of high vitamin-C content (31–53 mg. per helping) containing raw cabbage or water-cress were served at least once a week. This was, however, offset by difficulty in obtaining the regular supply of cabbage for normal cooking during the period of study. In all districts the permitted cost of the dinner was *5d.* per child, which, together with rationing, necessarily limited the nutritive value of the meals.

The results obtained by chemical analysis of the meals are included in table I, which gives the mean values for *all schools of each type in each district studied.* In the Surrey schools standard portions were served containing
a nearly
amounts
used for
so that the values in table I may be somewhat lower than the average amount of food consumed. The table is divided into three sections corresponding to the three age-groups (seniors, juniors, infants). At the end of each section the mean of all meals analysed with range and standard deviation is also given. The total number of meals completely analysed in all districts was 130. Values for the *total* amount of nutrients provided at the schools, assuming the consumption of a third of a pint of milk per day by each child, *are also given in table I.*

In all the schools an average of 80% of the children took advantage of the cheap milk scheme, which provides milk raises the amounts of all nutrients except vitamin C up to or above these recommended values. Improvement in cooking methods and supply of fruit and vegetables should result in a considerably increased intake of vitamin C, but we do not think it possible to raise the level

We are indebted to the Birmingham and Leeds education departments and Surrey county council for allowing us to carry out this investigation in their schools. The Leeds workers are indebted to Mrs. D. E. Dolby, Mr. J. W. Waters, and Mr L Davis for help with some of the analyses. Part of the expenses incurred in these investigations was defrayed by the Ministry of Food.

SULPHONAMIDES AND SULPHONES

NEW COMPOUNDS AND NEW NAMES

THE nomenclature of sulphonamides and sulphones given by D. G. Ardley in 1941 (*Lancet*, 1941, ii, 625) was as comprehensive as he could then make it It was brought up to date 18 months later (*Ibid*, 1943, i, 821) and the following additions should again make it fairly complete. New compounds have been included only if clinical reports—or at least references to clinical use—have appeared concerning them. An indication is given of the suggested use of unfamiliar compounds. Names printed in italics are believed to be non-proprietary.

Trade name or short designation	Full or shortened chemical name	Use and mode of administration	Country where described or manufactured
Aktisol Album	Sulphanilamide	By mouth and locally	—
Colistatin	Succinyl sulphathiazole	By mouth in intestinal infections	Britain
Diasone	Diaminodiphenyl sulphone disodium formaldehyde sulphoxylate	By mouth in tuberculosis	America
Diazil	Sulphadimethylpyrimidine	By mouth in pneumonia and other infections	Switzerland
Diazinol	Calcium sulphamonomethylpyrimidine	—	Switzerland
Drometil	Azosulphamide	By mouth	—
Flektyl	Sulphanilyl-dimethyl sulphanilamide	By mouth in gonorrhœa	—
Eleudron	Sulphathiazole	By mouth and locally	Germany
Furathron	Sulphanilyl dimethyl sulphanilamide	By mouth in gonorrhœa	—
Exoseptoplix	Sulphanilamide	Locally	France
Fontamide 2255 RP	*Para* aminobenzene sulphonyl thiourea	By mouth	France
Ganidan 2275 RP	Sulphaguanidine	By mouth in intestinal infections	France
Geigy 290 (Irgamid)	N^1 dimethylacroyl sulphanilamide	By mouth and locally	Switzerland
Geigy 867 Irgafen	N^1 3,4 dimethylbenzoyl sulphanilamide	By mouth in pneumonia	Switzerland
Glucostreptocide	Sulphanilamide glucoside	By mouth in chancroid	Russia
Haptocil	Di 2 (p aminobenzene sulphonamido) pyridine calcium tetrahydrate	Gonorrhœa and urogenital microbic infections in general	Switzerland
Homosulphanilamide	4 aminomethylbenzene sulphonamide (hydrochloride)	Local application to wounds	America
Irgafen Geigy 867	N^1 3,4 dimethylbenzoyl sulphanilamide	By mouth in pneumonia	Switzerland
Lucosil	Sulphamethylthiodiazole	By mouth in pneumonia	Scandinavia
Marfanil B	4 aminomethylbenzene sulphonamide (naphthalene disulphonate)	Local application to wounds	Germany
Methyl sulphidine	Sulphamethylpyridine	By mouth in pneumonia, meningitis, and gonorrhœa	Russia
Parazol	Sulphonamido chrysoidin	By mouth	Palestine
Plurazol	Sulphapyridine	”	—
Pelliseptil	Sulphathiazole	”	—
Promizole	4,2' diaminophenyl 5'-thiazolesulphone	Tuberculosis	America
Prontalbin	Sulphanilamide	By mouth and locally	Germany
Pyrimal	Sulphadiazine	By mouth	—
RP 116	Sulphamethylthiazole		France
S.B.	Sulphanilylbenzamide	By mouth in Sonne dysentery	Britain
S.I.B.	Sulphanilylamidobenzamide		Britain
Sepamide	Sulphanilamide	By mouth and locally	India
Solufontamide	*Triethanolamine p* aminobenzene-sulphonyl thiourea	Locally, intravenously, or intramuscularly	France
Soluthiazomide	Sodium sulphathiazole	Intravenously and intramuscularly	France
Soranil	Calcium sulphapyridine	By mouth	—
Steramide	Sulphacetamide	By mouth and locally	Britain
Steramide soluble	Sodium sulphacetamide	Locally	Britain
Streptolysin	Sulphanilamide	By mouth and locally	Canada
Streptosan	Sulphanilamide	By mouth and locally	—
Streptosil	Sulphanilamide	By mouth and locally	—
Sulazine	Sulphadiazine	By mouth	Australia
Sulfaguine	Sulphaguanidine	By mouth in intestinal infections	Australia
Sulfallantoin	*Para* aminobenzene sulphonamido-glyoxydiureide	Locally	America
Sulfocid	Sulphacetamide	By mouth and locally	—
Sulfoguanil	Sulphaguanidine	By mouth in intestinal infections	Switzerland
Sulmanyde	Sulphanilyl mandelate	By mouth in urinary infections	Britain
Sulphamerazine	Sulphamonomethylpyrimidine	By mouth	America and Britain
Sulphamethazine	Sulphadimethylpyrimidine	”	America
Sulphamezathine	Sulphadimethylpyrimidine	”	Britain
Sulphamezathine *sodium*	Sodium sulphadimethylpyrimidine	Intravenously or intramuscularly	Britain
Sulphamylon	4 aminomethylbenzene sulphonamide (hydrochloride)	Local application to wounds	America
Sulphathalidine	Phthalylsulphathiazole	By mouth in intestinal infections	America
Sulphathiazoline	2(p aminobenzene sulphonamido) thiazoline	By mouth in gonorrhœa	America
Sulphazole	Sulphamethylthiazole	By mouth in pneumonia, meningitis, and gonorrhœa	Russia
Sulphindon	Sulphadiazine	By mouth	India
Sumedin 2632 RP	Sulphamonomethylpyrimidine	”	France
Superseptyl	Sodium sulphathiazole	Intravenously or intramuscularly	Cuba
Tetracid	Sulphamethylthiodiazole	By mouth	Germany
Thiazomid 2090 RP	Sulphathiazole	”	France
Tibatin	Galactoside of 4,4' diaminodiphenyl sulphone	Intravenously or intramuscularly	Germany
Toriseptin M	Sulphamethylthiazole	By mouth	Japan
Ura-sulphazide T	Phenyl acetamido 4 sulphanilylurea	”	India
V 187	*Para* methylsulphanilyl benzamidine (hydrochloride)	Local application to wounds	Britain

Special Articles

RETURN FROM GERMANY

FROM OUR SPECIAL CORRESPONDENT

IN the language of the British Liberation Army POW means enemy prisoners-of-war. But PWex means a member of one of the Allied nations' fighting services who has been freed from an enemy prison camp.

The men I saw at Brussels at the Red Cross depot, where they were drawing handkerchiefs and soap and towels and razor-blades and chocolate and candies and combs—and quite a lot of other things if they wanted them—had just come in from Germany. One small group had been flown back in an empty bomber from near Munich. Others had come from nearer, but had taken much longer to do it. A private in the Rifle Brigade came out of the large shed at the back of a rest hostel where he had left off his old clothes and put on new battledress and new everything under the battledress. He spoke slowly and he moved slowly, for he had been five years in prison and during most of the time had worked as a miner in a coalpit near Posen in Poland. The food they got was mostly rye bread and soup and the Red Cross parcels. It was the parcels that kept them going. With the chocolate in the parcels as prison money the RB private and his friends had bought eggs from the Poles. With money they clubbed together, the prisoners of the mine had bought a wireless set from the Poles. and a man of the Signals had kept it going and repaired it when required. So for most of the long period of imprisonment they had been able to follow the course of the war through the BBC.

RATIONS AND MALNUTRITION

The ration of rye bread was not big: 7 men (British) had one kilogramme (2·2 lb.) loaf; but 20 men (Russian) had only the same quantity. Some Indian PWex men who came from near Madras had been in camp at a place near Hanover, and they had had a ration less than the British but more than the Russians. Indians too had been kept going by Red Cross parcels—Indian pattern—which contained rice.

The men I saw were stimulated by their regained freedom, and the prisoners who were ill had been already, many of them, sent to hospital. But the doctors who examined each man told me that of one large batch of nearly a thousand about half were suffering from malnutrition. When I asked what was the standard of malnutrition they used, they said "thin limbs, ribs sticking out of the chest, and anæmia." A large proportion of prisoners—and 10,000 had passed through the doctors' hands—were clearly below par, moving slowly.

Part of the medical work is to clear the ex-prisoners of lice and scabies with which some were infested. This was done by the application of a powerful dusting powder which, on a man's hair for instance, gave him the oddest appearance.

Some men had been in camps threatened a long time ago by the Russian advance. One man told me he had been four months on the march, and never during that time able to sleep without most of his clothes on him, including his trousers. When I talked to him he had lately come out of a hot bath; and what a luxury it had been. "You could hardly get men out of the baths," he said.

A BIG TASK

This flood of PWex men is only recent; it began about April 20, and it will go on until all the Stalags and the Oflags have been emptied. But it has been a big strain on medical and on Red Cross resources, and it has had to be met by brilliant and swift improvisation.

The size of the flood is all the greater because the PWex men include Poles, Russians, French, Belgians, Yugoslavs, Greeks, and Dutch. Three Russians I talked to, German and a few words of greeting in Russian, wer cheery and busy picking up what they needed from th Red Cross store. One man came from the Caspian another from Kiev. Whoever they are, there are host for them—and they are free.

Everyone is anxious to get men back to their hom as quickly as possible, and they are being brought in Brussels by plane and sent out from Brussels by plan Some of the British PWex are sent straight from whe they are freed in Germany to England—one of the thin it depends on is whether the plane has petrol enoug And health considerations must also be taken in account.

Distances are so great now in the 21st Army Group an that flying is the only way of covering the ground anything like what a PWex would consider reasona time. So forward area depots are being formed, and is a case of all hands being mustered for the wor In the Red Cross everybody helps—VADs, nurses, cooks orderlies, clerks. The depots of stores are large and are calculated to be able to deal with the many thousands PWex who will pass through. The medical services the Army supplies the doctors, or most of them, for th necessary hospital and inspection work. And th emergency is met by improvisation. One night the Re Cross learned that 1500 men were expected by train midnight. As it happened, a hostel for 2000 had ju been established in a military barracks and the YMCA had been installed in charge of a canteen. To this th Red Cross added a store, and six lorry-loads of comfor were sent up by 8.30 P.M. On the following day a Re Cross team was working in the airstrip ready to recei other PWex by air; also a resting-room was furnished at the airstrip, for some went on to England, after a shor delay. The Army Education Department coöperated with a large supply of the local news sheet giving BBC information; while NAAFI provided a mobile cantee and light refreshments.

What all this means to the man who has been 3, 4, or 5 years in the prison camp is not easy to imagine. Especially as the various kinds of help are for the most part given by the agency of efficient, friendly, and pleasant-voiced British women.

The planes are flying a thousand and more men on their way every day. The war in Europe ends, and PWex comes home.

(*To be continued*)

CANADA

FROM OUR OWN CORRESPONDENT

DEMOBILISED DOCTORS

REHABILITATION of medical officers leaving th Canadian Armed Forces is now in the hands of an enlarged and more representative board. Within a fe weeks the officers concerned will receive a booklet prepared by the new board, giving in detail the plans mad for assisting them to resume their practices or tak refresher courses or more extended postgraduate stud The Canadian Hospital Association and the schools medicine now have accommodation for 1350 studen in the refresher courses and a limited number of residencies for those desiring longer training in spec departments. Opportunities for qualification in vario specialties will be available to discharged officers work in the military and naval hospitals, which will con under the Department for Veteran Affairs.

REVISION OF THE CURRICULUM

The senate of the University of Toronto on March approved new regulations for the medical course. Th has hitherto consisted of a year's premedical wor followed by medical studies for five years each of weeks. In future the student will spend two years o premedical subjects followed by four years of medicin But the four years will each have 36 weeks instead of 3 so the time spent in medical studies will be practicall milk raises the amounts of all nutrients except vitamin C up to or above these recommended values. Improvement in cooking methods and supply of fruit and vegetables should result in a considerably increased intake of vitamin C, but we do not think it possible to raise the level

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Elektyl	Sulphanilyl dimethyl sulphanilamide	By mouth in gonorrhœa	—
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Lucosil	Sulphamethylthiodiazole	By mouth in pneumonia	Scandinavia
Marfanil B	4 aminomethylbenzene sulphonamide (naphthalene disulphonate)	Local application to wounds	Germany
Methyl sulphidine	Sulphamethylpyridine	By mouth in pneumonia, meningitis, and gonorrhœa	Russia
Parazil	Sulphonamide chrysoidin	By mouth	Palestine
Plurazol	Sulphapyridine		—
Pulsotil	Sulphathiazole		—
Promizole	4 2' diaminophenyl 5' *thiazole sulphone*	Tuberculosis	America
Prontalbin	Sulphanilamide	By mouth and locally	Germany
Pyrimal	Sulphadiazine	By mouth	—
RP 148	Sulphamethylthiazole		France
S 11	Sulphanilylbenzamide	By mouth in Sonne dysentery	Britain
S 4 B	Sulphanilylaminobenzamide	,, ,,	Britain
Septamide	Sulphanilamide	By mouth and locally	India
Solufontamide	Triethanolamine *p* aminobenzene sulphonyl thiourea	Locally, intravenously, or intramuscularly	France
Soluthiazomide	Sodium sulphathiazole	Intravenously and intramuscularly	France
Soranil	Calcium sulphapyridine	By mouth	—
Steramide	Sulphacetamide	By mouth and locally	Britain
Steramide soluble	Sodium sulphacetamide	Locally	Britain
Streptolysin	Sulphanilamide	By mouth and locally	Canada
Streptosan	Sulphanilamide	By mouth and locally	—
Streptosil	Sulphanilamide	By mouth and locally	—
Sulazine	Sulphadiazine	By mouth	Australia
Sulfaguine	Sulphaguanidine	By mouth in intestinal infections	Australia
Sulfallantoin	*Para* aminobenzene sulphonamido glyoxydiureide	Locally	America
Sulfocid	Sulphacetamide	By mouth and locally	—
Sulfaguanil	Sulphaguanidine	By mouth in intestinal infections	Switzerland
Sulmanyde	Sulphanilyl *mandelate*	By mouth in urinary infections	Britain
Sulphamerazine	Sulphamonomethyl pyrimidine	By mouth	America and Britain
Sulphamethazine	Sulphadimethyl pyrimidine	,,	America
Sulphamezathine	Sulphadimethyl pyrimidine	,,	Britain
Sulphamezathine sodium	Sodium sulphadimethyl pyrimidine	Intravenously or intramuscularly	Britain
Sulphamylon	4 aminomethylbenzene sulphonamide (hydrochloride)	Local application to wounds	America
Sulphathalidine	*Phthalyl sulphathiazole*	By mouth in intestinal infections	America
Sulphathiazoline	2(*p* aminobenzene sulphonamido) thiazoline	By mouth in gonorrhœa	America
Sulphazole	Sulphamethylthiazole	By mouth in pneumonia, meningitis and gonorrhœa	Russia
Sulphindon	Sulphadiazine	By mouth	India
Sumedine 2632 RP	Sulphamonomethyl pyrimidine		France
Superseptyl	Sodium sulphathiazole	Intravenously or intramuscularly	Cuba
Tetracid	Sulphamethylthiodiazole	By mouth	Germany
Thiazamide 2090 RP	Sulphathiazole	,,	France
Tibatin	Galactoside of 4 4' diaminodiphenyl sulphone	Intravenously or intramuscularly	Germany
Toriseptin M	Sulphamethylthiazole	By mouth	Japan
Uro-Sulphamide T	Phenylacetate of 4 sulphonamide urea	,,	India
V 187	*Paraaminomethyl* sulphanilyl benzamidine (hydrochloride)	Local application to wounds	Britain

In England Now

A Running Commentary by Peripatetic Correspondents

THE staff and patients of the Prisoner-of-War Eye Hospital and Braille School are now safely home. The school was a recognised branch of St. Dunstan's and taught both British and American blind, the total figure for the war being about forty men. It was run in conjunction with the eye hospital, which dealt with the eye casualties of prisoners of all Allied nations and had just over a hundred beds. The hospital staff consisted of an ophthalmic specialist and six RAMC orderlies, and the school staff of one officer (English), one Australian Air Force warrant officer, one corporal (English), one sergeant (New Zealand), and one private (English). We taught ordinary black-and-white typewriting, Braille reading, Braille writing, Braille shorthand, business correspondence, and so on. We also had equipment for cobbling, carpentry, basketwork, and string-bag making, and at various times taught massage, history, geography, and economics. Most of the men learnt to play some musical instrument—piano, accordion, and violin were the most popular—and at one time we had an orchestra and even put on an "all blind" variety show lasting about 2½ hours, complete with one-act plays and stage dancing.

Our library was equipped with an excellent selection of Braille books, educational and popular, and we had an extensive and varied collection of talking book records, English and American. A very popular item was the complete sound track of the Walt Disney film *Snow White and the Seven Dwarfs*. We also had plenty of popular and classical gramophone records. I am happy to say that through the timely arrival, and willing help, of the American Third Army all this equipment is now back at St. Dunstan's.

As regards surgical equipment, it was pretty well impossible to get suitable materials from the German authorities, and nearly everything we needed—drugs, dressings, sutures, and instruments—came from the British Red Cross Society or the Swedish YMCA. In the second half of the war, we had to deal with ectropion and other cicatricial deformities of the face in airmen who had been burned when their planes were shot down, but we were delighted to get a complete set of "plastic" instruments, identical with those used at the Air Ministry hospitals engaged in this special work. We were also fortunate in having supplies from England of 'Albucid Soluble' and penicillin. After our long period together, our little team of eleven feel sorry that we can no longer work together, but we are all very happy to be back.

* * *

During the past few weeks, with the kind help of the British Council, I have been studying housing conditions in some of the larger Swedish towns.

The most striking feature of small houses and apartments in Sweden is, of course, their cleanliness. I have seen slums—dwellings in narrow courts where the sun never enters, homes without water-supply, and with only a dismal row of bucket closets—but there was no dirt. The children of these slums were clean and well cared for, and even the worst houses made a brave show of decoration. Like other countries Sweden has its "problem families," and the social service is hard put to it to deal with them; but this does not alter the bright colours of the general picture.

The second feature that stands out prominently in modern houses is that central heating is universal. But here one must not make a virtue of necessity. Swedish winters are severe. In apartment houses and most of the single wooden "cottages" there is a stove in the basement with low-pressure hot-water circulation. The pressed metal radiators are both cheap and attractive. The stoves are designed for coke, but at present wood is the only fuel available. It is amusing to see the vast piles of wood stacked along the wide streets of the towns, and in public squares.

Recently experiments have been made in air-heating of small houses. The system is simple and effective. A stove in the basement heats water in the ordinary way, but the stove and its flue have also an air-jacket con- ted with a light metal channel which runs under the le length of the living-room and bedroom floors. this central channel the warm air is distributed through the spaces between the joists and rises through many small holes in the skirting boards to warm the walls and circulate through the rooms. By this means the wooden floors become pleasantly warm, comforting to the baby's bottom. The air is finally withdrawn through a large ventilator near the floor of the hall or principal room, filtered, and in large part re-circulated by an electric fan. The air-filter is of the oiled metal type commonly used in our motor-cars; it is easily removed for cleaning. Kitchen and larder are ventilated separately to the outside air. This type of heating is suitable for the small self-contained house and is relatively easy to install in prefabricated dwellings.

The third feature of the Swedish house, which made me jaundiced with envy, is the almost universal provision of rustless steel sinks and other kitchen fittings. The kitchens are small but well designed, with stacks of beautiful cupboards. Gas and electricity share the cooking load at present, but the post-war development of hydro-electric schemes will probably tip the scale in favour of electricity.

In spite of these three advantages—one personal, one climatic, and one environmental—Swedish houses are not an earthly paradise. They are too small, and they are often overcrowded. Overcrowding is as great a menace to health in Stockholm and Gothenburg as it is in Glasgow and Greenock. Rehousing is one of the hardest problems in the world, for controversy lurks in every detail of structure and equipment; but in England at any rate one issue is straightforward—the size of rooms. We have a reasonable tradition of space in housing, and our planning authorities are doing all in their power to extend rather than curtail. I am afraid the problem is more complex in Sweden. The houses there have an absolute lack of space. They are, as it were, congenitally overcrowded, and the people make things worse by their traditional way of life.

Give the Swedish family two small rooms and a kitchen, and you can trust them to convert one of these rooms into a "finrum"—a show-room with highly polished furniture, an expensive radio set, and decorations which would grace a neo-Victorian drawing-room. To secure this doubtful privilege they will stuff the family into the remaining room, or at best provide a couch in the finrum which serves for elegance by day and (by a swift turning and pulling) for sleep by night. As a rule the kitchen is too small to hold a table, but strenuous efforts are made to avoid taking meals in the show-room. Sometimes there is a tiny dining annexe attached to the kitchen, and occasionally a corner of the hall serves this purpose. In one important respect, however, the Swedish showroom is better than the bleak parlour of our council houses—it is gay and warm. The benefits of central heating extend to every room, making them all useful by day as well as by night. The bedrooms are in fact bed-sitting rooms, not refrigerators.

No doubt the internal bathrooms found in so many Swedish and American houses fill the formal sanitarian with horror. But they do not fill the house with smells. The ceiling ventilator is as efficient as the little window through which our smells are blown back into the house.

The Swedish authorities take an immense amount of pains to make the best use of every nook and cranny in their little homes. What troubles me, however, is that all this ingenuity is spent in fitting incredible amounts of material into a small space, instead of enlarging the space. Compared with Sweden our space standards are generous indeed, and that is what makes me nervous about our entering the portals of diminutive building. Here a bad pun may serve as a good warning.

Why, you may ask, are the Swedes so clean, house-proud, and well fitted with furniture and gadgets? I can't pretend to give a full answer to this question, but this at least may be said: they have had 145 years of uninterrupted peace, and, in recent years at any rate, unexampled prosperity. Their standard of living is high and their birth-rate correspondingly low. There are no poor; and those that run near the border-line have the benefits of an excellent social service and cheap medical care. Sweden is a democratic nation with a strong respect for law; they even walk on the left side of the pavement! Yet one still wonders why their rooms are so small, and why even post-war standards of space are low by our reckoning. One reason alleged is that the cost of land is so high; but this hardly fits in with the idea of a democracy of no poverty and no riches. One possible explanation is that an old tradition persists. Before central heating was introduced it was no doubt difficult to warm large rooms with the "continental" stove, so family life crowded round the source of heat; and now, as so often happens, the practice continues although the reason for it has gone.

* * *

"This is the machine," said the Inventor. "We call it the E-E—the Encephalo-eyeopener. A man sitting in that chair there has his thoughts and feelings recorded on this screen here. If he is a seen-word thinker, the written word appears on it; if a heard-word thinker, we actually hear the voice from a telephone affair behind the screen; if he is just an ordinary visual, his moving picture appears with a variable amount of coloration. The youngsters think in vivid colours, the old 'uns more in black and white. We haven't been able to get a satisfactory representation on the screen of olfactory, gustatory, and tactile thought yet, but they are working on that in the Children's department." "Yes," I said doubtfully, hoping yet dreading he was going to ask me to take the chair.

"Of course," he went on, "we never made much progress until Bitz invented his filter. Before that the screen was a jumble of pictures, sounds, voices, written words, with smudgy blanks where the lower senses' thoughts and feelings were coming through, all of them in endless
variety, or actual,
with co complete
chaos an ' I asked.
"Now w itz allows
only the or feeling
on to the screen, and only one at once instead of a dozen or two as in the old days. It shows in fact only the most conscious part of the consciousness. Gosh, it has made for understanding all right! It's made things so simple that it is amazing that those old johnnies in the forties, Freudians and so on, hadn't spotted it." I nodded him on.
is that thought a
thing as continuo
chair who thinks
in a series of wave
each spasm of thinking he drew on his stored pictures or remembered a tune or stroked his hair or scratched his ear, and the pleasant tactile sense dominated his consciousness; or he sniffed the cold air or waggled his foot, and the cold-smell sensation or kinæsthesia occupied our screen here. And after each sensation thought streamed out. Sensation is the afferent, thought's the efferent. It's like the old nerve-muscle preparation." This conception was new to me, and although I said "yes" I felt I was being cowardly and uncritical—as in dreams.
"Of co to give
rise to f people
spend m w-grade
feeling and almost formless thought."

I happened to say something about the five senses. He laughed. "Funny old Georgian and Elizabethan phrase that! Why, with this machine we have demonstrated at least sixty and every one of them thinks—that is to say, sends afferent impulses from which special and appropriate thought is the response. The whole body thinks except the strictly keratinous." Came a pause in which he scratched an eyebrow. "That's the second great point we learnt from the Bitz filter. Thought is never purposeless—it is always in response to and adapted to deal with the call or entreaty or suggestion of a particular afferent sensation."

I asked him where the emotions came in, and he showed me a device on the machine which made the screen glow red for aversion, then through all the colours of the solar spectrum to the violet of love. Thus a visual in the chair thinking of an unpleasant rival would see a moving picture of him with a reddish background. "In fact," the Inventor continued, "the emotions differ from the other sixty senses only in that they have stronger family feeling, they must work squabbling together, they can't work alone. That applies to the old 'five senses' in some degree too. If you reduce their calls down to one line, you go to sleep. It was the basis of hypnotism." Suddenly he shot a question at me. "Have you ever noticed how before you do go to sleep there is an orderly regression of sensation, the tactiles being the last of the special senses to go, then the joint and muscle and visceral senses fade away in that order, and the autonomic takes over?"

Later on I must have been very abstruse and he was trying to be simple and patient with me; anyway, I got a gorgeous sentence from him which I have strained my meagre power of seen-word thinking to memorise:

> "If you take a rapid survey from the time when the first living bit of protoplasm had connexion with its watery surroundings and the intimacy of chemical change took place—the first tactile sensation—to the time millions of years later when this simple mechanism had been elaborated to taste, smell, hearing, and sight; letting your mind halt for a moment on that epoch-making event when repeated stimulus brought flagging response, and later when the stimulus was repeated, an altered response, because some byproduct of tiredness had laid the first bricks of what was to become human memory, it will dawn on you with the conviction of daylight that thought is response to sensation, which is none the less sensation because it is stored."

Yes, he
that fell
as I dre
"Well, what about it? The Ethnological people want records of some earlier types," I clove his head with my hatchet and smashed his machine, and shouted, "This is I, this is my citadel, none shall have the master-key to show the tawdriness of its secrets. Man has grown by believing he is godlike and very precious and these beliefs are the title-deeds of his existence as Man." With a triumphant whoop I dashed from the ultra-modern clarity of the neon millennium back to the dear familiar shadows and barbarities of my own age.

SPECIAL FIELDS IN NURSING

AT present a special year of service is required from State-registered nurses in one of the branches of nursing where shortage of staff is most acute. On the advice of the National Advisory Council for the Recruitment and Distribution of Nurses and Midwives—which is designed to represent both nurses and midwives and their employers—the Minister of Labour and National Service has decided that for the present this year of special service must still be required of the newly qualified nurse, and has published a list of "fields" in which she will be welcome. These include: tuberculosis nursing,
mental nursing,
training as a mid
in practice as a n
as a district nurse
nursing for a year after qualifying; employment in EMS hospitals designated by the Ministry, or by the Department of Health for Scotland; nursing in a cancer hospital; nursing or training in an ophthalmic or an ear, nose, and throat hospital, or in a children's hospital; training for part 1 of the CMB examination, to be followed by 6 months in any other special field, or, for women over 27, opportunity to train for the health visitor's certificate, with the obligation to practise for a year as a health visitor after qualifying.

Nurses who have had experience in the special fields
ate
e a
of
re
is needed to bring the trained staff of a training hospital up to its full complement, and this period may be extended by a further 6 months if necessary. Such deferments will exempt the newly qualified nurse from an equal period of work in one of the special fields.

THE SCIENTIFIC FILM ASSOCIATION.—The following films will be shown by the association on Wednesday, May 23, at 5.3
et, London,
W1:
erentiations of
Living.
Myasthenia Gravis and *The Effect of Centrifugal Force on Fighter Crews*. Tickets may be obtained from the secretary of the medical committee, Dr. S. J. Reynolds, 14, Hopton Road, SW16.

Letters to the Editor

A PARENT AT HOSPITAL

SIR,—I hope that a recent experience of my own may be of interest in the discussion of defects in our hospital system.

A few days after our arrival from America, my son, aged 7, became suddenly and seriously ill in a small town where we were both strangers. During the night he developed alarming symptoms, severe headache and pain in the chest, with a temperature of 104° F. I called in a doctor as soon as possible. In her opinion, as in my own, the symptoms suggested pneumonia, but as it was too early for certain diagnosis, she proposed that he should be taken to the local cottage hospital, in case the illness turned out to be something requiring surgical treatment. Meanwhile I was to treat the case as probable pneumonia. I mentioned that I had with me a supply of sulphadiazine. The doctor asked me to give him at once the initial dose and to take the tablets to the hospital with me, where she would leave instructions for their administration, as well as for a poultice and hot-water bottle to relieve the pain. I consented to take the child to hospital on condition that she would arrange with the matron that I should be allowed to stay *with him*, considering it inadvisable that a child should be left to strangers in a strange place after the recent anxious experience of an Atlantic voyage.

I then took the child to the hospital. There was a hot-water bottle in his bed, which soon afterwards a nurse removed and did not bring back. No poultice was brought, *no water for him to drink, though he was calling for it* constantly, and no sulphadiazine was administered. After enduring his calls for water for an hour, I went in search of a nurse and asked her for some. She brought a cup half full. I also nerved myself to ask for the return of the hot-water bottle, the child's pain having become agonising. When the next dose of sulphadiazine was overdue by an hour I administered it myself, and notified the nurse of this when next I saw her. I was told that no instructions had been left by the doctor for the administration of sulphadiazine, and that they could not administer dangerous drugs without express instructions from the doctor. With this I agreed, but suggested that since I had such instructions I could administer the drug myself, absolving the hospital staff of responsibility. The reply to this was that my presence in the hospital was against regulations and I must leave at once. I was anxious to avoid friction and understood the difficulties of the overworked hospital staff, but as the child had now begun to cough up the rusty sputum characteristic of pneumonia it was clearly of the most urgent importance that he should be given the drug without delay. I therefore declined as firmly and politely as possible to leave him and explained to the matron that, in the opinion of the doctor, the child was probably suffering from pneumonia. This provoked only a sneer.

Returning to the child after this discussion, which had taken place in the corridor, I found him wandering unsteadily about the room, babbling not merely of green fields, but of torpedoes, lifeboats, and German invasions. When the next emissary was sent to evict me I asked if a special nurse could be left with him if I consented to go. The reply was an indignant snort. I said, very reasonably, that as they were short of staff and the child was obviously not fit to be left, the best solution would be to allow me to stay with him, rather than to banish me to helpless and useless anxiety outside the hospital gates. After this I was left comparatively unmolested, and most of the nursing the child had that day was done by me. Hour after hour I stood at the foot of his bed, humouring his delusions. I am sure that my familiar presence was more soothing to him than that of any nurse, and his anxious voice recalled me at once if I moved to the window for a breath of air.

It was twelve hours before the doctor reappeared, with the house-physician. I was asked to wait in the corridor while they made their long examination. No chair was offered me, and by this time, having watched by him all night and all day, I was faint with fatigue and anxiety.

When at last the two doctors emerged one of them barked at me: "You come from America I understand. I don't know what filthy germs you may have brought back with you." Pneumonia was bad enough: the suggestion that some other serious and deadly disease was present was a very great shock. I asked what disease he suspected. He [illegible]ced out, without any attempt to reassure me, that he [illegible]ted meningitis. Swallowing this, I asked him what [illegible]cance he attached to the rusty sputum. "What rusty sputum? Sister never mentioned it." Three of the hospital staff had been with the doctors while they conducted their examination, but as none of them had previously been with the child at all, none of them had observed this symptom, and if I had not been there it would have escaped observation. I said as much, the patience which, for the child's sake, I had desperately striven to keep all day, having by now worn rather thin. Both doctors went back with me to the child's room. I had not been able to preserve any adequate specimen of the sputum, no cup or gauze having been provided, but fortunately the patient obligingly produced one under the eyes of both doctors. This helped the situation considerably. It was apparent that I was not wholly devoid of sense and that my presence had been useful. This was not openly admitted, but I was told in a much more considerate tone that a lumbar puncture should be performed to decide whether or not meningitis was also present, pneumonia being now certain. I was asked to go away for food and rest while this was done and to meet both doctors at the hospital later.

When I returned to the hospital I waited in the lobby, sending in my name by a nurse who was passing, with a message to the effect that I would wait there until the doctors were ready to see me. In the confusion of [illegible] name had either not been mentioned or had [illegible]. I deeply regret to record that from this moment I was treated by everyone concerned with the utmost cordiality and consideration.

The result of the lumbar puncture was negative. It was agreed that I should remove the child in the morning, but I regretted my consent to his staying there overnight when I heard from him an account of the night he had passed. It was the night of June 5, and therefore rather noisy. The boy was not used to the noise of aircraft and found it disturbing; he was also puzzled by my absence. When he called for me, the nurse threatened to smack him and removed his teddy-bear, not for reasons of hygiene but as a punishment. This bear was his habitual comfort for pain or grief, and was that night his only association with his familiar background.

Serious illness is an intensely lonely experience. Even adults, lying in a strange private world of pain, are grateful for friendly human contact, and find themselves desiring to treat their nurses as, long ago, they would have treated their mothers. I feel very strongly that when children are patients in hospitals some member of their family should be allowed to remain with them whenever this is possible. In my own case there was no reason for not waiving the rule of no visitors. My son was in a ward for two and the other bed was unoccupied. *In any circumstances, to restrict parental visits to two days a week, as in this hospital, is inhuman.*

It may be argued that the presence of parents in large wards would be an intolerable nuisance: then we must spend enough on our hospitals to do away with large wards, which are an absurd and unhygienic anachronism. It may also be said with truth that some parents are ignorant and hysterical. Their ignorance is a result of the almost total lack of instruction in matters of health in our State schools. As for their hysteria, I am afraid that this is all too often a natural result of the nightmare sense of frustration, anxiety, and impotence produced when normal affectionate parents are ignored or worse by hospital nurses, whose manner suggests that the child has ceased to be anyone's concern but their own.

I understand thoroughly that both the doctors and nurses with whom I had to deal were overworked and harassed. Some forgetfulness and ill-temper were excusable. But the fact remains that if I had not possessed sulphadiazine, some medical knowledge, determination, and the habits of a class accustomed to the comfortable hospitality of [illegible] would have waited at least twel[illegible]ment, alone and frightened. I shall not forget this accidental revelation of the rigidity and lack of psycho*logical understanding in our hospital system. I have* had a great deal of experience, both as a patient and as a parent, of physicians, nursing-homes, and the private wards of hospitals. Never before had I experienced gross neglect, rudeness, or enforced separation. I reflect that never before had I experienced illness in a strange place, unknown, out of reach of specialists and important hospitals, with no medical care available except that provided for the poorest of the population, and I find the reflection disquieting.

Cambridge. PATRICIA RUSSELL.

THE MEDICAL SUPERINTENDENT

SIR,—"This indifferent clinician, then, who finds after a few years of practice that he is not so keen on the profession of his original choice . . ." Few will quarrel with Dr. W. A. Lister's definition (April 21): this individual is responsible for "Discipline in a Medical Service" as discussed by Dr. R. G. Cooke. For many reasons the alternative system mentioned by Mr. T. B. Layton (April 7) will commend itself to most. The painless extermination of the classical medical superintendent, so ably advocated by Dr. Lister, is the target for tomorrow, if tomorrow is to dawn on a world of enhanced medical efficiency, as everyone—lay and medical—hopes.

Let the cobbler stick to his last; the pathologist to his departments; the physician to his patients and assistants; the surgeon to his theatre, wards, and assistants; the anæsthetists and radiologists to their spheres of responsibility; the matron to her nurses, wards, and stores; the dispenser to his personnel, department, and stores; and the catering superintendent to his (or her) kitchens, stores, assistants, and purchasing staff: the office of works deals with all building and repairs; the hospital accountant keeps a tally on all expenditure and income; the almoner conducts her beneficent secret service. All are working for the patient and to uphold the good name of the hospital. All the principals named are heads of departments, and should meet in a routine conference once a week—or at some interval decided by general agreement—to discuss general policy and interdepartmental difficulties. The chairman of this routine meeting should be appointed by the vote of the conference.

The question is, of course, who employs all these people? The answer to this question is being decided by the Government of the country, after consultation with all the interests concerned on a national scale; and everybody is interested in the result.

FRANK MARSH.

INFANT MORTALITY IN THE MEDWAY TOWNS

SIR,—On May 5 (p. 576) you reported a statement in Parliament by Captain Plugge that there is a "very high" infantile-mortality rate in the Medway towns. These towns are Rochester, Chatham, and Gillingham, and I desire to point out that as far as Gillingham is concerned Captain Plugge's statement is inaccurate. The rate for this borough in 1943 was 15 per thousand births and the provisional figure for 1944 is 17.

W. A. MUIR,
Gillingham. Medical Officer of Health.

RETURNED PRISONERS-OF-WAR

SIR,—Recently I have read many letters and articles
-war. Many of these
and resentment among
because members of the
medical profession (and others) who have no real knowledge of life behind barbed wire must be allowed the privilege of hypothesis—no matter how wild or unreasonable. Why, however, does Major G. C. Pether (May 5, p. 571) consider that some recollections of a civilian internment camp in 1914–18 may be helpful in dealing with the returned Kriegsgefangener?

I have no knowledge of last-war camps, but I do feel that Major Pether's views are somewhat exaggerated. I was a POW in Germany for 3½ years, from 1940 till 1943, and I found *nothing*
expressed in his article.
internees, excepting to say
they are likely to be made
of-war. Certainly among
any camp I stayed in, of h
by the enemy. Rather most of the boys had a feeling of superiority which manifested itself in many ways—for example by appearing at roll-calls to be one or two men short and causing "Jerry" to count the men and find the correct number on parade. It was quite common to see 22 men playing a hard game of soccer without a ball, for the benefit of puzzled German onlookers who willingly believed that insanity prevailed in the camp. I have seen MAs, D Scs, and D Phils queue behind other men at the camp latrine, but never have I seen them weep under their humiliation. Major Pether has here forgotten the British sense of humour. To my knowledge very few *petty* acts of sabotage were committed. One stole coal, lump by lump, for one's own comfort, and escape was attempted mainly because it was a soldier's duty and partly to show Jerry that it was possible.

Among a large number of prisoners (the wounded) work was not compulsory and very few men felt inclined to work. They were too busy working for exams, learning to play musical instruments, &c., and most of them found that the days were too short. During the dark days—when Moscow was in danger, for instance—all prisoners were cheerfully certain that 21 miles of water lay between Germany and world domination. With victories such as Stalingrad came the desire to taunt the camp guards. Long friendships remained firm throughout and are now continued among repatriated men. Suicides seldom seemed to happen.

Home-coming seemed
ever happened, and I ne
of hysteria, or of agoraph
of wounded and protected personnel. The process of settling into civilian life was very simple—POWs themselves were amazed that they could settle down so easily. Sex relationships (so far as I have been able to observe) were accepted or resumed just as naturally as everything else.

Certainly the official reception of prisoners is better than in 1918, and certainly full social and educational aid should be at their disposal; but if the doctors are so unfair as to consider returning men as unusual in any way, then the prisoner can do without medical aid until POW medical officers return home with their knowledge of camps and camp life.

Finally, the POW of this war has never considered himself inept in war and will not consider himself as being inept in love. He knows that he is much wiser, and more considerate, self-reliant, and normal than he was before being captured. Must his chances of decent employment be destroyed by pseudo-scientific letters and articles which are likely to be read by prospective employers?

Billingham-on-Tees. T. H. HAWES.

Obituary

LORIMER JOHN AUSTIN

MCHIR CAMB., FRCS, FACS

AFTER two years' illness Dr. L. J. Austin, professor of surgery in Queen's University of Kingston, Ontario, died on March 20 at the age of 65. He was London-born, but his father moved to Bristol on becoming a judge, and he was educated at Clifton and Cambridge. Qualifying in 1906 from the London Hospital, he became house-physician, house-surgeon, resident accoucheur, and finally surgical registrar there. On the outbreak of war in 1914 he went to France as second-in-command of a British Red Cross unit. After a short experience of war in Namur and Mons he and another member of his unit were taken prisoner; but after six months he was repatriated through Holland and joined the Royal Army Medical Corps in which he became a major.

After the war Austin spent two years in Bristol before going to Canada. In 1920 he was appointed professor of clinical surgery in Queen's University, and on the death of Professor Mundell in 1923 he became professor of surgery. He was one of the founders of the Royal College of Physicians and Surgeons of Canada and a member of the Canadian Association of Clinical Surgeons.
rt in the work of the Canadian
of the Ontario Medical Associa-
atter in 1931. In Kingston he
and esteem; he was constantly "doing good by stealth" to people in distress, especially helping handicapped children and young men to better their condition, and one of his friends said that "every cent he spent made someone happy." As a teacher he was the admiration of his students, and as a lecturer he was known and appreciated by the profession all over Canada.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

LAST week the House of Commons, like the nation at large, was released from a great burden. The crowds that surged around Westminster, by day and night, the great cheers for the Prime Minister in the House when he came to announce the news—all meant the same—release, joy, victory.

Parliament took pride nevertheless in carrying on with its dignified routine. There was the hour for questions on Tuesday, May 8, as on any ordinary day. There were the supplementary questions as the rules allow. But there were two great differences. The Speaker was not dressed in his everyday black but in gold brocade and ruffles. The Sergeant-at-Arms was in his full splendour too. And the House—for the first time I can remember—was full for the prayers with which its proceedings open.

Immediately after his announcement of unconditional surrender the Prime Minister proposed the adjournment to attend a service of thanksgiving at St. Margaret's Church which is, so to speak, the [illegible] members of the House of Commons. T[illegible] service in Westminster Abbey. The account of the service in Hansard ends: "Whereupon, the Bells of St. Margaret's Church were rung in celebration of Victory."

Next day the Home Secretary announced a big list of revocations of Defence Regulations, and the following day we heard of further releases from war pressure including rebirth of the basic petrol ration, reallocations of man-power, and a small beginning with demobilisation.

Thursday also saw the passing of a large part of the committee stage of the Family Allowances Bill. It had been decided to leave the question whether the allowances should be paid to the father or the mother to a free vote of the House—an unusual procedure on a matter of such importance. But the free vote was not necessary. The committee of the whole House agreed, without a division, that payment should be made to the mother. It was not a case, as someone said, that "the Ayes have it" but that "the wives have it."

NATIONAL FLOUR

In the House of Lords on May 8 Viscount CLIFDEN informed Lord Hankey that in England, Wales, and Northern Ireland the present overall extraction of national flour for bread-making, allowing for the addition of Canadian imported flour, was 79·25%. The same figure also applied to Scotland, except for batch bread, where it may fall to 78·6%. The only minerals for which routine analyses are carried out were calcium and iron. For these two elements the average contents in either the English or the Scotch loaf were approximately 610 and 12·5 parts per million respectively. The loaf which contained 85% extraction home-produced flour also contained Canadian imported flour, and the corresponding figures were 620 and 17 parts per million.

QUESTION TIME

Tuberculous Ex-Service Patients

Sir LEONARD LYLE asked the Secretary of State for War whether, in view of the increasing number of Service personnel who had contracted tuberculosis during their period of service and who, in consequence, were discharged from the Service before they could be admitted to sanatoria, he would make a new regulation whereby such personnel were not penalised by having contracted this disease and would be entitled to the same privileges as other members of the forces suffering from war disabilities—namely, that they should not be discharged from the Service until at least eight calendar months had elapsed from the date of their first absence from duty on account of their disability.—Sir JAMES GRIGG: I explained the present position in my answer of March 20, and I am afraid that until civil sanatoria are prepared to accept serving soldiers as patients I cannot do what my hon. friend wants. This question is still being pursued.

Sir L. LYLE: *Is it not lamentable that these gallant men* who have been struck down by this disease should not be entitled to the same treatment as other soldiers, especially in [illegible] of the fact that they are now treated in the same category as civilian patients?—Sir J. GRIGG: It is no good trying to import prejudice into this matter. They could only be treated properly in civil sanatoria, and civil sanatoria are not at present prepared to accept soldiers as patients.

Dr. E. SUMMERSKILL: Why is the M[illegible] establish military sanatoria in order to [illegible] this injustice?—Sir J. GRIGG: Because hospital accommodation has been arranged in this war in the main under an emergency medical system, and not a system and a series of military hospitals.

Mr. H. McNIEL: Will the Minister use the powers which I am sure he has to rent or requisition a number of beds for this purpose in EMS hospitals so that these men can be treated.—Sir J. GRIGG: I understand that at present that is not possible. I am doing my best to produce a solution to this admittedly serious anomaly, but I have not got a solution yet.—Sir L. LYLE gave notice that he would raise the matter in debate at the first opportunity.

National Loaf

Colonel J. J. LLEWELLIN, Minister of Food, replying to Mr. R. R. STOKES, said that the decision to reduce the extraction-rate of wheat from 85 to 80% was taken on Aug. 4, 1944, and was made effective on Dec. 31, 1944.—Mr. STOKES: Can we be assured that the recommendation of the Nutritional and Medicinal Standing Committee was taken into full consideration before the decision was taken; and is it not a fact that they are totally opposed to the decision?—Colonel LLEWELLIN: It was certainly taken into consideration, and it is not a fact that the committee opposed the decision.

Mr. A. BEVAN: In view of the great anxiety caused to dietitians by this change, will the Minister place in the library the technical and dietetic advice which he received before he made this change?—Colonel LLEWELLIN: I do not think that would be the normal practice. It was a committee of officials reporting to Ministers, and it is not usual to publish such reports, but I am prepared at any time to explain to the House why this step was taken.—Replying to further questions, Colonel LLEWELLIN said it was the Government's view that they were giving the people better bread by what they had done. If Mr. Stokes could see the letters of appreciation from the public on this change he would agree that the decision was right.

West African Medical and Nursing Students

Mr. R. W. SORENSEN asked the Secretary of State for the Colonies whether there was any restriction on the number of West Africans who could apply for training in British medical schools, and for training as nurses; and how many were now receiving such training in this country.—Colonel O. STANLEY replied: The answer to the first part of the question is no. Under war conditions, however, training institutions have been obliged to limit the number of Colonial medical students that can be accommodated. Student nurses have hitherto come to this country only by private arrangement, but steps are now being taken by Government to expand and systematise facilities for such training here. The number of West African medical students at medical schools in this country is understood to be 76 (including 12 Government scholars). There are also 11 medical students doing preliminary studies. There are believed to be about 10 girls being trained as nurses in this country.

On Active Service

CASUALTIES

MISSING PRESUMED KILLED

Surgeon Lieutenant JOHN NAIRN LENNOX, LRCPE, RNVR, HM destroyer *Kashmir*.

WOUNDED

Captain L. E. S. COGHLAN, MB EDIN., RAMC
Captain C. K. HIRSON, MRCS, RAMC
Captain H. M. JONES, MC, RAMC
Captain H. R. THOMSON, MB LOND, RAMC

AWARDS

M C

Captain C. H. K. DALY, MRCS, RAMC
Captain SAMUEL McCLATCHIE, IAMC
Captain H. I. C. MACLEAN, MB GLASG., RAMC
Captain BALAKRISHNA NAIR, IAMC
Captain J. C. PORTNUFF, RCAMC
Captain D. N. VORA, IAMC
Captain C. H. WATTS, MRCS, RAMC

The following are citations on awards of the Military Cross already announced in our columns.

Major P. C. **Mitchell**, RAMC.

[illegible]

date over [illegible]
majority in [illegible]
mortar fire. [illegible]
and Suthel [illegible]
Major Mitcl [illegible]
wounded. [illegible]
he remained [illegible]
wounded we [illegible]

Captain J. A. **Tulloch**, RAMC

[illegible] after dark was possible.

Captain Robert **McIlwraith**, RAMC.

[illegible] under him.

MENTIONED IN DESPATCHES

Surgeon Lieutenant M. D. **Dawson**, RANR.

MEMOIR

Captain J. C. **Swanson**, RAMC, who died of wounds in Western Europe on Feb. 27, was the son of Mr W. A. Swanson and Dr. Maud Swanson of Golders Green. He was educated at Fettes College, Edinburgh, where he won many cups for sport. From Clare College, Cambridge, he entered Middlesex Hospital where he qualified in [illegible] Hospital, he joined the RAMC at the be- [illegible] were rugby and chess. He played for the first XV of the London Scottish and for Cambridge against Oxford in 1938, while for two years he held the chess medal for the Individual Competition. He was 27 years of age.

Elliott & Fry

Collection of Blood.—In a single day's session, a mobile team from the Ministry of Health's blood-transfusion centre at Leeds recently collected blood from 820 donors at a military unit. This is said to be the highest number of donors ever dealt with by one team during one working day. The team consisted of one doctor, assisted by 12 nurses, a blood-grouping technician, and a clerk, and it worked from 9 AM to 4.30 PM. Next day the blood was flown to the BLA.

Notes and News

HUMAN RELATIONS IN INDUSTRY

As he looked back with us over nearly six years of vicissitudes, Mr. Churchill, in his broadcast of May 13, made us realise how truly we are members of one another. Mr. Ernest Bevin, Minister of Labour, with an equal sense of this truth, would like to see us plan the future by its light. At a conference on management and demobilisation, held by the Institute of Industrial Administration on May 12, he spoke of the worth of the personnel officer—a man, he believes, who should have equal standing with the works manager.

In 1941 Mr. Bevin was responsible for starting short training courses for these officers at three of our universities, and since then 800 have trained, and most of them are in posts. More than 5000 personnel managers or welfare supervisors are now employed in some 3000 factories, and about 170 whole-time and 700 part-time medical officers in about 200 factories. Industrial nurses have reached the high figure of 7000. He spoke with insight of the need for a new discipline in industry, based on our war experience that men work best when they know why they are working. He hoped to see the last of the discipline of "the sack," far sterner than Service discipline which for a similar offence would give a man a few days in gaol or confined to barracks.

He would like men to be chosen for jobs that suit them, new-comers to be trained for their work, and old hands returning from the wars to be given the chance of attending refresher courses. He hopes to see the Reinstatement Act applied according to the spirit not the letter, the Serviceman's special problems being kept well in mind.

Mr. Bevin spoke warmly of our debt to the disabled: "let us recognise the value of their potential services and go forward boldly to make a place for them in industry." The appointments department of the Ministry of Labour has been reorganised, and will help members of the Forces to settle back to work. We have "many million pounds' worth of new tools now in Britain," he said, "but none of them compares in value with the man who works them."

CONFUSION OF GAS CYLINDERS

The Ministry of Health has sent a circular to local authorities and EMS hospitals reminding them of the danger in anæsthetic apparatus of connecting a gas cylinder to the wrong inlet—for example, connecting the nitrous oxide cylinder to the oxygen inlet. The Ministry suggests that wherever someone other than the anæsthetist replaces gas cylinders, or connects anæsthetic apparatus to a pipe line installation, a second person, preferably a doctor, should subsequently examine the connexions and note in a record book that he has done so.

WORLD REQUIREMENT OF NARCOTIC DRUGS

The Permanent Central Opium Board of the League of Nations has authorised the publication of a 32-page pamphlet entitled "Pre-War Production and Distribution of Narcotic Drugs and their Raw Materials." The author, Mr. L. F. Atzenwiler, is an official of the Board and from an analysis of the statistics supplied to the Board during the 4 years 1934–1937 shows the amount of the production of each narcotic of each country and how disposed of by consumption or export. The statistics are those furnished under the International Conventions of 1925 and 1931, but the control of commerce between nations in opium and other dangerous drugs dates from the earlier Convention of 1912.

The graphic method adopted of showing by sectors in a circle the proportion of the world production of each drug for which each of the contracting countries is responsible renders comparisons easy to the eye. Thus in the case of raw opium, with a world total of 18,501 tons produced in the 4 years 1934 to 1937, 12,098 tons or 65·4% are attributed to China, 6·7% to India, and 6·1% to Turkey. [illegible] that for China no [illegible] were available. "[illegible] was used for domestic consumption by addicts. Chinese opium has never appeared in licit international traffic." While 970 tons of raw opium were exported to morphine manufacturing countries, 782 tons went to territories for manufacturing "prepared" opium for smoking. As regards coca leaves produced mainly in Bolivia, Peru, Colombia, Netherlands Indies, Formosa, Japan, and Ecuador, estimation of production is difficult, seeing that the coca bush is a hardy evergreen growing wild, living for years and not like opium sown and cultivated annually.

Turning to morphine the diagram gives 137,360 kg: as the world total manufacture of which 22% is attributed to the United States, 16·3% to Germany, 11·1% to Japan, and 5·8% to the United Kingdom. Of heroin the world total manufactured was 3621 kg., 33·1% thereof being by Japan and 12·2% by the United Kingdom, none being attributable to the United States. The war has increased the demand for narcotic drugs "and it would seem that wartime requirements *for medical and scientific purposes* will begin to decrease with the cessation of hostilities." The pamphlet concludes that the normal licit requirements annually for the following drugs should be: morphine 8355 kg.; heroin 950 kg.; and cocaine 3840 kg.

University of Oxford

On May 3 the following degrees were conferred:

D.M.—*Forrest Fulton.

B.M.—J. P. Herdman, W. J. Hughes Butterfield, P. L. Skeggs, I. V. Polunin, H. J. Shaw, R. A. Brownsword Drury, Susan A. J. Chappel, Janet E. Poulton, Jean M. Briscoe, *C. L. Balf, *D. C. G. Bett, *H. R. Morton, *M. I. Bostock, *H. D. Darcus, *P. C. Elmes, G. R. B. McCarter, *J. D. Judah, and *P. J. N. Cox.

* In absence.

University of Sheffield

The Medical Research Council is to establish a biochemical research unit in the university under the direction of the professor of biochemistry.

Royal College of Surgeons of England

At a meeting of the council on May 10, with Sir Alfred Webb-Johnson, the president, in the chair, Dr. R. A. Willis, who has arrived from Melbourne, was admitted as the first Sir William H. Collins professor of human and comparative pathology. The Hallett prize was awarded to William Burnett of the University of Aberdeen.

The British Association of Urological Surgeons was added to the list of specialist associations having a joint secretariat at 45, Lincoln's Inn Fields.

Diplomas of membership and in medical radiodiagnosis and radiotherapy were granted to the candidates named in our report of the comitia of the Royal College of Physicians of London (*Lancet*, May 5, p. 581).

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty with Mr. William A. Sewell, the president, in the chair, Jane Hyslop Merry (Glasgow) and William Malcolm Gibson (Glasgow) were admitted to the fellowship.

Royal College of Physicians of Ireland

At a meeting of the college on May 4, the following were elected to the fellowship: V. C. Ellis, J. C. Gaffney, P. A. McNally, and J. N. P. Moore.

Harveian Society of London

Sir Alexander Hood, director-general of Army Medical Services, will deliver the Harveian lecture at the Royal College of Surgeons of England, Lincoln's Inn Fields, London, WC2, on Monday, May 28, at 3.30 PM. He is to speak on Total Medicine.

Royal Eye Hospital

A meeting of the clinical society will be held at the hospital, St. George's Circus, Southwark, London, SE1, on Friday, May 25, at 5 PM, when Dr. T. H. Whittington will speak on alternating strabismus.

Medico-Legal Society

At a meeting to be held at 26, Portland Place, London, W1, on Thursday, May 24, at 5 PM, Dr. Edward Glover will read a paper on the social and legal aspects of sexual abnormality.

Royal Society of Medicine

At a joint meeting of the sections of urology and obstetrics and gynæcology at 4.45 PM, on Thursday, May 24, Prof. Chassar Moir will describe two cases of urinary incontinence continuing after repair of large vesicovaginal fistulæ, relieved by unusual methods. Afterwards Mr. J. Gabe, Miss Gladys Dodds, and Professor Moir will open a discussion on urinary complications of pregnancy. The discussion on biochemistry and psychiatry at the section of psychiatry which was to have been held on VE day will now take place on May 24 at 5 PM. Mr. G. D. Greville, D SC, and Dr. Derek Richter are the opening speakers. On May 26 the section of disease in children will hold their annual general meeting at 3.15 PM at St. Helier Hospital, Carshalton, Surrey.

Royal Medico-Psychological Association

At the meeting of the association at City Council House, Birmingham, on Thursday, May 31, at 2.15 PM, Dr. T. C. Graves as past president will deliver his valedictory address on the reduction of the distinctions drawn between mental ill health and physical ill health. Lieut.-Colonel A. A. W. Petrie will hold the office of president till 1946.

St. Cyres Lecture

The St. Cyres lecture of the National Hospital for Diseases of the Heart will be delivered in the Barnes hall of the Royal Society of Medicine, Wimpole Street, London, W1, on Wednesday, June 6, at 5 PM, by Prof. J. Crighton Bramwell. His subject will be coarctation of the aorta. Members of the medical profession are invited.

British Council for Rehabilitation

This council held its first study course during the week May 7–11. The centres visited were Horton Emergency Hospital, Roffey Park rehabilitation centre, Queen Victoria Hospital plastic surgery unit, the Government training centre at Slough, Queen Mary's Hospital [illegible] and Queen Elizabeth's Training College [illegible] Dr. Harold Balme gave a general survey of the subject; Mr. St. John Buxton dealt with the orthopædic aspect, and the other speakers included Mr. John Hunter, Dr. T. M. Ling, Mr. Langdale Kelham, and Mr. E. S. Evans. At the final session Lord Rushcliffe, chairman of the council, presided.

Parliamentary Candidate

Dr. Charles Hill, secretary of the British Medical Association, has been adopted as Independent candidate for the University of Cambridge.

Appointments

HOLMES, J. W. O.: examining factory surgeon for Heanor, Derby.

WARD, G. W., MB MANC.: temp. asst. MO and asst. school MO for Bucks.

National Hospital, Queen Square, London, WC1.—The following part-time registrars have been appointed:

KENDALL, DAVID, BM OXFD, MRCP.
SANDIFER, P. H., MRCP, DPM.
STEWART-WALLACE, A. M., MD LOND, MRCP, DPM.

Births, Marriages, and Deaths

BIRTHS

FAIRBAIRN.—On May 8, at Oxford, to the wife of Captain Anthony Fairbairn, RAMC—a son.

FINN.—On May 7, at Southampton, the wife of Surgeon Lieutenant Andrew Finn, RNVR—a daughter.

GREEN.—On May 7, the wife of Dr. N. Mayer Green, of Upper Brook Street, W1—a son.

METCALF.—On May 5, at Bristol, the wife of Major James Metcalf, RAMC—a daughter.

WILSON.—On March 1, at Dar es Salaam, Tanganyika Territory, the wife of Dr. H. T. H. Wilson, Colonial Medical Service—a son.

YOUNG.—On April 19, in London, the wife of Surgeon Lieutenant Keith Young, RNVR—a son.

MARRIAGES

DUDGEON—ASHTON.—On May 8, [illegible] stair Dudgeon, MC, captain RAMC, to [illegible]

HERD—PATERSON.—On May 7, at [illegible] 3, to Edith Paterson of Innerleithen.

LYLE—COWAN.—On May 5, at Hambledon, David Wieford Ranken Lyle, MRCS, to Anne H. Cowan.

RUMSEY—STEVENSON.—On April 18, at Grafton, New South Wales, Aldridge Cecil Rumsey, major RAMC, of Crowborough, Sussex, to Anne Dorothy Stevenson.

DEATHS

ALLEN.—On May 3, William Herbert Allen, MB CAMB., of Calverton, Nottingham.

LIVESAY.—On May 4, at Norwich, Arthur William Bligh Livesay, MB EDIN., FRCSE, surgeon captain RN retd.

LORRAINE.—On May 12, at Montpelier Square, London, SW7, Joseph Currie Lorraine, MD EDIN., FRCSE, aged 58.

MENZIES.—On May 10, at Wetherby Place, London, SW7, James Herbert Menzies, MRCS, aged 83.

ODDIE.—On May 8, at Croxley Green, Herts, Samuel Ingleby Oddie, MB EDIN., aged 76.

POWELL.—On May 4, in Dublin, Caleb Keays Powell, MD, M CH RUI, lieut.-colonel AMS retd.

SELLS.—On May 8, at Northfleet, Hubert Thomas Sells, MRCS, aged 86.

SHARPE.—On May 7, at Bexhill, Herbert Sharpe, BA CAMB., MRCS, formerly medical superintendent of Ware Park Sanatorium, Herts.

WOODWARK.—On May 11, in London, Sir Stanley Woodwark, CMG, CBE, MD LOND., FRCP, aged 70.

[illegible] upply owing
[illegible] not be taken
[illegible] e for export.

TYPING OF STAPHYLOCOCCI BY THE BACTERIOPHAGE METHOD

G. S. WILSON, MD LOND., FRCP, DPH, KHP
PROFESSOR OF BACTERIOLOGY AS APPLIED TO HYGIENE, UNIVERSITY OF LONDON; DIRECTOR OF THE EMERGENCY PUBLIC HEALTH LABORATORY, OXFORD

J. D. ATKINSON, FIMLT
CHIEF TECHNICIAN IN THE LABORATORY

THE original observations on transmissible bacterial lysis were made by Twort (1915) on cultures of staphylococci, and have since been amply confirmed. Lisbonne and Carrère (1922), working with *Bact. coli*, discovered the occurrence of latent bacteriophage infection; and Fisk (1942) described a method by which the latent carrier state could be revealed in *Staphylococcus aureus*, and different strains of this organism distinguished from each other. The purpose of the present paper is to report an extension of Fisk's technique that renders possible the identification of staphylococcal types in a [illegible] e and his co-workers [illegible] and Yen 1938) for [illegible] bacilli.

TECHNIQUE

Preparation of crude filtrates—The original strains of bacteriophage—often in an impure state—were obtained by Fisk's method. Strains to be examined for latent phage contamination were grown i[illegible] 37° C. Each strain was [illegible] Four drops (0·1 ml., [illegible] surface of a 0·2% glucose-agar plate, and, after these had dried, the remaining cultures were "spotted" on to it. When the drops had been absorbed, the plates were incubated at 37° C for 6–8 hours and left at room temperature overnight. Phage action was revealed next morning by the presence of either discrete plaques or a narrow zone [illegible] than 0 5 mm. in diameter, aroun[illegible] culture. The growth of any pair [illegible] of phage action was scraped off the agar and suspended in a small volume of broth. This was centrifuged, and the supernatant fluid was tested against both strains to find out which was the lysogenic and which the susceptible strain. The remainder of the lytic supernatant fluid was added to a 2–4 hour 0·2% glucose-broth culture of the susceptible strain and incubated at 37° C for 4–6 hours. As soon as evidence of lysis became apparent, the culture was added to a fresh culture [illegible] ested against the [illegible] The result was [illegible] oduced confluent lysis.

Purification of filtrates.—The crude filtrates thus obtained were plated out with the susceptible strain, and a single plaque was picked off and spread on a 0·2% glucose-agar plate. This plate was incubated for 6–8 hours and then kept at room temperature overnight. A fresh plaque was picked next morning, and the process repeated once. The growth from [illegible] broth cultures, as described in the preparation of the original filtrates, until a potent lytic agent had been obtained. The final filtrate was kept in the ice-chest without preservative.

Titration of lytic filtrates.—The Seitz filtrates from the last serial broth cultures were diluted 1/10 to 1/1,000,000 with [illegible] the filtrate. Plates were incubated in the usual way for 6 hours, kept at room temperature overnight, and read next morning. [illegible] that showed no phage action with the test dilutions of the available lytic filtrates were tested with the undiluted filtrates. If evidence of phage action was observed with any filtrate, a single plaque was picked off with some of the surrounding growth, and spread over a glucose-agar plate. Propagation of the phage was then carried on by the method already described.

Method of setting up tests.—Nutrient agar plates containing 1·5% of agar and 0·2% of glucose are dried at 37° C for an hour with the lid partly removed. The strain to be typed is grown in 0·2% glucose-broth for 8–10 hours, and 4 drops of the culture are spread evenly over the surface of a plate. After about 15 minutes, when these have dried, a standard loopful—or, if several strains are being tested, a drop of appropriate size from a Pasteur pipette—is "spotted" on to the culture. For the sake of convenience the bottom of the plate is divided by a glass-writing diamond into 25 half-inch squares, so that 25 lytic filtrates can be tested, if desired, on any one strain. When the drops have been absorbed, the plates are incubated for 6–8 hours, left at room temperature overnight, and read next morning. The scheme of notation we have used is as follows:

Confluent lysis with no secondary growth ..	+ + + +
Confluent lysis with secondary growth ..	+ + +
Numerous semiconfluent plaques	+ +
Discrete plaques	+
Less than 20 plaques	±

RESULTS

The total number of strains of *Staph. aureus* that we have examined is 1340. Most of these were derived from the nose, hands, skin lesions, breast abscesses, wounds, or burns of patients suffering from staphylococcal infections of one sort or another, or from suspected nasal or skin carriers. A few were isolated from food believed to be responsible for poisoning of the toxin type, or from the vomit or fæces of victims of food-poisoning. Of this total, 46 were used for obtaining strains of bacteriophage by Fisk's cross-culture method; 29 of these 46 staphylococcal strains showed evidence of lysis, 25 of them were found to be latent carriers of phage, and 7 different strains of bacteriophage were obtained from them. Eleven further phage strains were prepared by growing one of the original phages in the presence of a later strain, a variant of the phage being developed in much the same way as with Craigie's typhoid phages.

TABLE I—BACTERIOPHAGE TYPE DESIGNATIONS OF STAPHYLOCOCCI

Confluent lysis = +; semiconfluent lysis = ±; lesser degrees of lysis, or no lysis = −

Phage type of coccus	Bacteriophage filtrates *																					
	3/284	3/211	31/115	6/3	7/4	42/1163	47/36	47/1163	29/33	31/18	52/144	3/284	3B/1339	42A/1307	44/16	14/373	44/761	47/987	41/1163	51/145	52/144	52/925
1A	+	−	+																			
1B	−	+	−																			
1C	±	+	+																			
2A				+	−	+	+	+														
2B				±	+	+	+	+														
2C				−	−	+	−	+														
2D				−	−	−	+	+														
3A									+	+	−											
3B									−	+	−											
3C									−	+	+											
4												+										
5													+									
6														+								
7															+							
8																+						
9																	+					
10																		+				
11																			+			
12																				+		
13																					+	
14																						+

* The bacteriophage filtrates are designated according to the strain from which the phage was originally derived (first number) and the strain on which it was propagated (second number).

The preparation of these 18 different bacteriophage strains took time, so that the staphylococci we examined in the early stages of our work were tested against only some of them. The last 160 cultures, however, were thoroughly examined. Of these, 278 (60·4%) were typed, 104 (22·6%) were acted on by phage but did not fall clearly into any of the 21 types that we have so far defined, and 78 (17·0%) proved insusceptible to all our lytic filtrates.

In table I is set out the method by which the different types of staphylococci are recognised. It should be made clear that the notation in this table differs from that described above. For the sake of simplicity we have recorded confluent lysis of the 3-plus or 4-plus variety as +, semiconfluent lysis of the 2-plus variety as ±, and any degree of lysis less than this, or no lysis at all, as −. It should further be noted that this table is a diagnostic schema, similar to the Kauffmann-White schema for the serological identification of members of the salmonella group—intended to facilitate the differentiation of staphylococcal types, not to give the complete range of lytic filtrates to which each type is susceptible. Examination of table I shows the presence of 21 types or subtypes. In types 1, 2, and 3 we have included strains of staphylococci that are acted on by more than one test filtrate in our series, even though, as with 1B and 3B, the action of only one filtrate is recorded. Strains belonging to types 4 to 14, however, are lysed completely by a single filtrate only, when used in the test dilution, though they may well prove to be susceptible to fresh strains of bacteriophage that we hope to isolate in the future.

TABLE II—DISTRIBUTION OF 278 STRAINS OF *Staph. aureus* WITHIN THE PHAGE TYPES

Phage type	Strains of staphylococci		Phage type	Strains of staphylococci	
	No.	%		No.	%
1A	12	4·3	4	10	3·6
1B	14	5·0	5	9	3·2
1C	7	2·5	6	9	3·2
2A	24	8·6	7	18	6·5
2B	1	0·4	8	1	0·4
2C	10	3·6	9	2	0·7
2D	1	0·4	10	51	18·3
3A	22	7·9	11	7	2·5
3B	10	3·6	12	9	3·2
			13	3	1·1
3C	6	2·2	14	52	18·7

Table II shows the frequency distribution of the 21 staphylococcal types. Apart from types 10 and 14, no type comprised more than 10% of the whole. Taking this in conjunction with our failure hitherto to type 40% of the total strains, we may be fairly confident that the method of phage typing is destined to prove of considerable value in epidemiological investigations.

PHAGE TYPING OF STAPHYLOCOCCI IN EPIDEMIOLOGICAL INVESTIGATIONS

Fisk and Mordvin (1944) have been able by the cross-culture method to show the relationship to each other of different strains of staphylococci isolated from the same patient; but this method is purely qualitative, is subject to variation in the activity of the phages, and is not altogether suitable for enabling the type of different strains from epidemic sources to be readily defined. It was for these reasons that we endeavoured—with some success—to develop a method of typing by means of lytic filtrates prepared from different strains of bacteriophage, such as has proved so valuable in the study of the typhoid bacillus. A few examples may be given to illustrate the application of the method to epidemiological problems.

(1) *Food-poisoning outbreak in Hampshire.*—An account of this outbreak of staphylococcal food-poisoning has been given by Duncan (1944). Briefly, 40 out of 200 persons in a Civil Defence column were attacked. Investigation narrowed the incriminated food down to a meal of cold cooked ham. Coagulase-positive staphylococci were isolated in very large numbers from the ham, and were found by phage typing to belong to a subtype of type 2. Examination of a strain cultured from the vomit of one of the patients showed that it belonged to the same subtype. Nasal swabs taken from eight members of the kitchen staff yielded heavy growths of *Staph. aureus* in 4. One of these proved to belong to the same phage subtype as that isolated from the ham and the patient's vomit. It came from the chef who had been responsible for carving the 200 portions of ham on the day before the outbreak. It seemed clear that the chef had infected the ham with staphylococci, which had multiplied overnight and formed enterotoxin.

(2) *Pemphigus outbreak in a Berkshire maternity home.*—This outbreak was investigated by Dr. R. L. Vollum, who has kindly supplied us with the following notes: The home has accommodation for 25 mothers. The staff consists of a matron, 5 other midwives, 4 nursing auxiliaries, 4 resident domestics, 2 daily women, one man, and a resident laundress. Between Oct. 2 and 20, 1944, six cases of pemphigus occurred. Swabs were obtained from the skin lesions of four of the babies (the other two had been discharged), and *Staph. aureus* of phage type 7 was isolated from each of them. *Staph. aureus* was also isolated from four members of the staff; one of the strains, coming from the laundress, belonged to type 7. The same type was cultured from the nipples, but not the nose, of two of the mothers, both of whom had infected babies. The evidence suggested that the laundress was responsible for spread of the infection among the babies, some of which infected their mothers.

(3) *Food-poisoning outbreak in Dorsetshire.*—This outbreak has been reported by Cooper (1943). The members of a household suffered from acute food-poisoning after eating meat pies. *Staph. aureus* was cultured from one of the pies in enormous numbers—about 500 million per gramme. A similar organism was also isolated from the vomit of one of the sufferers. Both proved to belong to phage type 2A. Four persons had been responsible for filling the pies; one of these had an unhealthy-looking nasopharynx. Nose and throat swabs were taken from each of them. Coagulase-positive staphylococci were found in two of the nose and one of the throat swabs. One of these strains, from the person with the unhealthy nasopharynx, proved to belong to phage type 2A. This person had apparently been responsible for infecting the meat pies.

(4) *Outbreak of pemphigus at a maternity home in Lincolnshire.*—Dr. J. M. Croll of Lincoln, who investigated this outbreak, sent us 43 strains of coagulase-positive *Staph. aureus* derived from 2 midwives, 4 nurses, 1 mother, 6 healthy babies, and 9 babies suffering from blisters or other septic lesions. The strains from all the affected babies belonged to phage type 10, as did also a strain from the nose of a healthy baby who later developed pemphigus. The only other persons who were carrying this type were a midwife, who herself developed pemphigus, and a nurse who was carrying it in her nose and had a sore finger. The evidence suggested that the nurse was probably responsible for the origin of the infection.

For other outbreaks in which phage typing has proved useful, reference may be made to Cruickshank (1943) for an account of a food-poisoning outbreak at Barnstaple in which infection was traced to one of the three persons who prepared the incriminated brawn, to Hobbs (1944) for an account of an outbreak of breast abscesses in a nursing-home in which a persistent throat carrier of the same type was found in one of the nurses, and to Macdonald (1944) for an account of a very unusual outbreak of food-poisoning traced to goat's cheese. The method has also been employed with success in tracing the origin of staphylococci in secondarily infected wounds and burns (see Miles, Williams, and Clayton-Cooper 1944).

SUMMARY

A method is described for the preparation of lytic filtrates to *Staphylococcus aureus*.

By this method lytic filtrates corresponding to 18 different bacteriophage strains have been prepared.

The use of a technique similar to that for the phage typing of typhoid bacilli has enabled us, so far, to recognise 21 staphylococcal types or subtypes.

Of 1340 strains of *Staph. aureus* examined, the last 460 were submitted to the action of all our lytic filtrates. Of these, 60·4% were successfully typed, 22·6% were acted on by phage but were not typed, and 17·0% proved insensitive to any of the phages in our collection.

Of the 21 types or subtypes into which the typed strains fell, only 2 included more than 10% of the strains.

Some examples are quoted of outbreaks of food-poisoning, pemphigus, and breast abscesses in which the origin of the infection was traced by phagetyping of the strains.

This method is likely to prove of considerable value in the investigation of outbreaks of staphylococcal infection.

References at foot of opposite page

TREATMENT OF ACUTE CONJUNCTIVITIS AND TRACHOMA WITH SULPHONAMIDES

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DURING the 1941 summer epidemic of Koch-Weeks conjunctivitis we began to examine the use of sulphanilamide and some of its derivatives in local and oral treatment of this disease.

In the Near East Koch-Weeks conjunctivitis appears as an epidemic in the summer and early autumn and affects children especially. It is highly contagious, usually attacks both eyes, and is characterised by an abundant discharge, extreme swelling of the lids and conjunctiva, blepharospasm, and intense discomfort. *Corneal complications may develop which prolong* treatment and sometimes lead, especially in trachomatous cases, *to severe corneal ulcers* Infection is transmitted from eye to eye by flies or by contact If the conjunctivitis is left to itself it subsides in 6–8 weeks, but usually it does not heal completely and becomes a chronic inflammation with acute exacerbations (Feigenbaum 1921). Roemer (1912) calls it one of the most contagious diseases known, and Feigenbaum points out that in babies it may seriously disturb nutrition. A Koch-Weeks conjunctivitis treated with silver nitrate shows definite improvement after 4–6 days, but complete cure takes about 3 weeks

We started our experiments with 'Pyranil' (Teva Ltd.), which had shown strong bactericidal activity in vitro and in vivo.

Pyranil is a compound containing *p* aminophenyl sulphonamide in addition to pyridine dicarbonic acid anhydride.

Olitzki and Rappaport state that it has both bactericidal and bacteriostatic qualities of a high order, and that it stimulates phagocytosis.

An ointment was prepared which contained 5% of the active principle in an adequate ointment base.

LOCAL TREATMENT

In a group of children with Koch-Weeks conjunctivitis the procedure was to treat one eye with pyranil ointment and the other eye with silver nitrate (2%).
Of 13 child
n both eyes.
In 3 cases
pyranil and
cocaine-atr
result One
patient in
t respond to
pyranil wa
who had to
be treated with silver nitrate and was only cured after 4 weeks.

In a few more cases of
one of which showed in
keratitis—both eyes were t
as well as with silver nitr
excellent results. Thus *one child* was cured in 9 days, and the keratitis case, in which cocaine-atropine was also used, was almost cured in 5 days.

In Koch-Weeks conjunctivitis the average period of treatment was, with pyranil as well as with silver nitrate, 10–11 days, after another week of treatment with '*Argyrol*' or zinc sulphate at home all patients were definitely cured.

The success *of* combined treatment with pyranil and silver nitrate may be due to the silver coagulating the *superficial epithelial layers* which are eventually shed, enabling the pyranil to attack any remaining germs, and stimulate the local protective mechanism. Judging by our experience so far pyranil alone does not seem *inferior to silver nitrate, and combined with silver* nitrate it appears to be more effective than silver nitrate alone.

SULPHONAMIDES BY MOUTH

These results encouraged us to try sulphanilamide and sulphapyridine by *mouth. although the action of* these substances was supposed to be limited to cocci. The favourable results obtained *in gonococcal* conjunctivitis treated with sulphapyridine by mouth are familiar, but the results we obtained in Koch-Weeks infection surprised us.

Sulphanilamide by mouth, 0 05 g. per kg. body-weight daily. had no effect on the Koch-Weeks inflammation,

treatment with silver nitrate seemed slow in comparison.
About 50 cases,
70 years, were tre
within 24 hours:
disappeared com
mouth began; in
a few days longer and subsided after appropriate local treatment. It soon became clear, however, that, as with gonorrhœa, one must not stop treatment after the first symptoms disappear. Unless it continues for at least a week there may be a relapse which will not respond to sulphapyridine. The following course give the best results:

is given in
. every 2–3
rd day this
dosage is repeated; during the next 4–5 days it is gradually diminished. If slight swelling and injection of the conjunctiva remains, treatment is to be continued with argyrol, 'Noviform' ointment, or some other antiseptic ointment.

This treatment always gives prompt results. The swelling of the lids and the blepharospasm disappear on the 2nd day and the abundant discharge abates, the eyes can be opened, the pain has subsided, and the patients report that sleep is again possible. Next *day* the *discharge* has sometimes stopped altogether, and the lids are normal, though the conjunctiva still shows *some swelling and redness.* This is a critical stage, since the patients are apt to discontinue treatment because they no longer *feel any discomfort*; but if treatment is stopped at this stage, the conjunctivitis often recurs, and sometimes takes weeks *to* cure.

Too prompt in effect, easily mistaken for complete cure, is the only disadvantage in this treatment. We did not observe any untoward complications in our cases. Unlike the usual treatment with silver nitrate it gives rise to neither pain nor discomfort, and is much quicker and more effective Sulphapyridine applied locally had not the slightest effect.

Without speculating too freely on the way in which sulphapyridine works, we may note one fact drawn from our experience:

Smears taken every two hours from the conjunctiva in a number of cases were examined microscopically. During the first two hours of treatment nothing of importance was observed, but 6 hours after the first dose the Koch-Weeks bacilli showed *definite* changes, and these became more and more pronounced after 8, 10, and 12 hours The bacilli became broader and *more than* twice as long At the same time their number decreased, and fragments of these changed bacilli appeared intracellularly (figs 1, 2, and 3). Within 14 hours of the first dose not a single bacillus could be detected in the smears, and from then on, while treatment *continued*, the smears appeared microscopically sterile.

These findings can be easily explained. As soon as the sulphapyridine concentration in the blood reaches the necessary level it begins to act on the bacilli. This

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PROF. WILSON, MR. ATKINSON: REFERENCES

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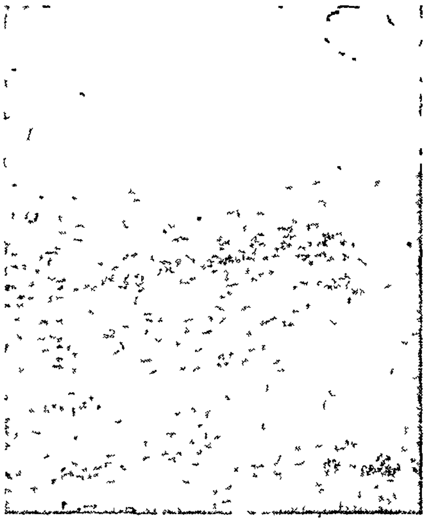

Fig. 1—Smear taken before treatment.

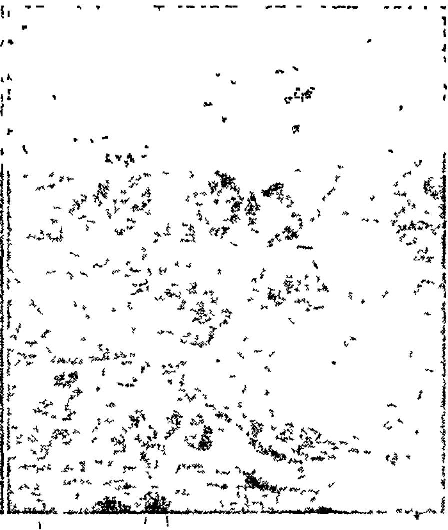

Fig. 2—Smear taken 8 hours after first dose of sulphapyridine.

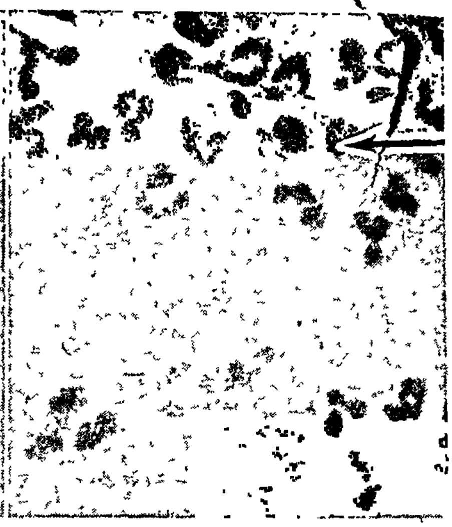

Fig. 3—Smear taken 12 hours after first dose of sulphapyridine.

seems to happen after 6 hours. The structural changes indicate degeneration of the bacilli, which disintegrate during the next few hours, fragments being quickly disposed of by phagocytosis. Phagocytosis of morphologically normal bacilli is not uncommon, and can be observed in untreated cases as well as in cases treated with silver nitrate. Structural alterations of the bacilli, however, are not observed in smears from untreated cases or cases treated with silver nitrate. Axenfeld (1907) found, in cultures, involution forms similar to those observed in our cases, and we found similar forms once in a case of Koch-Weeks conjunctivitis which had been treated elsewhere for about 6 weeks with instillations of an 'Optochin' solution.

The effect of sulphanilamide and sulphapyridine on the morphological appearance of cocci is naturally difficult to observe since they cannot change their aspect much, apart from becoming larger or smaller. The effect on bacilli is therefore interesting, especially since such changes have never been noted in cases treated by the usual local remedies, either in free bacilli or in bacilli which have undergone phagocytosis.

It seems that a few bacilli may sometimes survive the onslaught of sulphapyridine, and these single bacilli multiply if the treatment is not continued. This must be borne in mind if satisfactory results are to be gained.

TRACHOMA

Finally sulphanilamide, sulphapyridine, and pyranil have proved valuable in the treatment of trachoma.

The beneficial results of sulphanilamide in trachoma have been repeatedly stressed; given by mouth, it is already an indispensable adjuvant to the treatment of corneal complications.

We treated complications (pannus inflammatorius, infiltration, and inflammation of the cornea) locally with pyranil ointment and the results obtained were excellent. In many cases it proved unnecessary to give atropine. In severe corneal complications, resisting every therapeutic attempt, this ointment is the treatment of choice, though it does not, of course, exclude the use of atropine and sulphanilamide by mouth, or make it unnecessary to squeeze out of the trachomatous granules, if they need it. We have seen no case which did not show an immediate response.

DISCUSSION

The importance of these new methods must be stressed in view of the havoc caused by Koch-Weeks conjunctivitis and trachoma in the Near East. Feigenbaum emphasises that trachoma is often transferred with Koch-Weeks conjunctivitis and finds an ideal ground for developing in the inflamed, loosened conjunctiva. In a country where trachoma is endemic the apparently harmless Koch-Weeks conjunctivitis thus plays a noxious rôle. A quick and reliable cure is important, the more so since secretions from untreated cases as well as of cases treated with silver nitrate, are capable of spreading the infection even long after the acute symptoms have subsided. Within 14 hours of the beginning of sulphapyridine treatment, however, the secretion from the eyes becomes sterile.

SUMMARY

In 13 cases of Koch-Weeks conjunctivitis one eye was treated with 'Pyranil' ointment and the other with 2% silver nitrate. The results in 12 cases were equally good in both eyes.

Treatment of Koch-Weeks conjunctivitis by pyranil ointment jointly with silver nitrate was more successful than treatment with either alone.

Cases of Koch-Weeks conjunctivitis treated with sulphanilamide by mouth, without local treatment, did not respond, but those given sulphapyridine by mouth cleared up in a few days.

Sulphapyridine and pyranil have also proved valuable in the treatment of trachoma.

We wish to thank Prof. A. Feigenbaum for his kind assistance and Lieut.-Colonel G. I. Scott, RAMC, adviser in ophthalmology to the MEF, for permission to publish this paper.

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PENICILLIN BY INHALATION

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THE quantitative aspects of inhalation therapy have been dealt with in an earlier paper (Mutch and Hoskins 1944), to which the reader is referred for details of the physical and biological factors concerned. In the trials there described sulphonamides were administered in mist form through a Collison inhaler, and analyses of mist, blood, and urine indicated that amounts of drug could be introduced into bronchiectatic patients and normals which were adequate both for the topical treatment of bronchial conditions and for constitutional action. It was suggested that penicillin might be employed in a similar manner and in the present communication the relevant measurements are given. In the meantime Knott and Clark (1945) have published interesting work on the absorption of penicillin from the air of rooms into which penicillin solutions have been nebulised, and have obtained evidence of the presence of penicillin in the urine of persons exposed to such atmospheres for various periods.

NEBULISER, CIRCUIT AND SOLUTION

In our experiments with penicillin the method of administration already standardised for sulphonamides was adopted.

Mists were produced by the Collison nebuliser actuated by oxygen pressure and delivered along wide stream-lined conduit iece detached from a BLB, c was instructed to breathe ie lips serving as an outlet ive (was to secure a maxim e respiratory mucous urfaces. cipally in zones of turbulence, as in the region of valve flaps, irregular urfaces, or sudden expansions of lumen. Within the ody the greatest turbulence is that produced by the eversal of the direction of air flow between the alternating phases of respiration In the circuit employed external turbulence is minimised and internal turbulence s confined to the respiratory tract proper with the exception of a small region between the larynx and the auces which is shared both by the respiratory and the alimentary tracts.

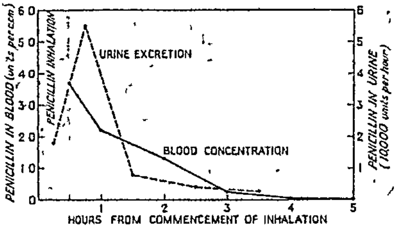
From earlier observations it was computed that half an hour's inhalation of mist from one nebulising phial passing 8 to 10 litres of oxygen per minute and containing a neutral aqueous solution of penicillin of 80,000 units per c.cm. would ensure an absorption of at least 40,000 units of the drug. Such proved to be the case and the routine was adopted for our assay. Penicillin mists of this density are respirable without causing any definite distress provided that the purer forms of penicillin powder are selected. Merck's calcium penicillin was satisfactory but the lower grades of English penicillin were far too irritant for this purpose. Dr. E. S. Duthie kindly assayed a specimen of penicillin to serve as a standard for our estimations, and we are indebted to Dr. C. G. Pope for his product used (720 to 757 Oxf

Five healthy youn laboratory workers) were selected for the survey. A preliminary trial was made in each case with the easily visible mist formed from 2% glycerin in water and the rate of oxygen flow was adjusted to the individual's minimal requirements. The penicillin solution was then switched in to replace the glycerin for 30 minutes. Samples of blood and urine were collected as indicated in the table and penicillin contents estimated by Heatley's method (see fig.). The strength of the residual solution left in the nebuliser was also estimated to ascertain whether half an hour's intimate exposure to pure oxygen at a temperature a little above zero had caused any undesirable destruction of the drug.

DISCUSSION

The volume of solution nebulised varied rather widely from 2 c.cm. to 4·1 c.cm., a difference which is too great to be attributed entirely to variation in the ventilation rates of the different men. The excess probably represents wasteful mist production caused by incorrect adjustment of the rate of oxygen flow. Loss from oxidation was insignificant. The average amount of penicillin recovered from the urine was 60,850 units. The exceptionally high excretion by the subject R.R. during the second hour was doubtless caused by water diuresis and suggests that the amount of penicillin actually absorbed by the other men was substantially greater than 60,850 units. Although penicillin administered by injection appears quickly in the urine, there is always a large excretion deficit; for example 10% when 10,000 units are given, representing penicillin which leaves the body by other routes or is converted into inactive forms (Florey et al. 1941, Rammelkamp and Keefer 1943, Rammelkamp and Bradley 1943). Even if no correction is made for wasteful production of mist, for incomplete recovery from the urine, or for destruction in the body, the figures

administered by the same technique. The best recovery secured by water diuresis (R.R.) indicated absorption of over 40% of the nebulised drug.



The general pattern of excretion and of drug concentration in the blood was the same in each case, although conspicuous variation occurred in the blood-levels in different individuals. Maximal excretion took place during the half-hour following inhalation, and the next

PENICILLIN IN URINE AND BLOOD AFTER ½ HOUR'S INHALATION OF PENICILLIN MIST

(Collison nebuliser direct to nasal mask; calcium penicillin in water 80,000 units per c.cm.)

Subject	Penicillin nebulised: Concentration of penicillin in phial (units per c.cm.): Original sol.	Penicillin nebulised: Concentration of penicillin in phial (units per c.cm.): After ½ hr. run	Penicillin nebulised: Concentration of penicillin in phial (units per c.cm.): Av.	Penicillin nebulised: Loss in weight of phial during ½ hr. run (g.)	Penicillin nebulised: Penicillin delivered as mist (units)	Urinary excretion: Time from start of ½ hr. inhalation session (hr.)	Urinary excretion: Volume (c.cm.)	Urinary excretion: Penicillin content (units)		Blood concentration: Time from start of ½ hr. inhalation session (hr.)	Blood concentration: Penicillin units per c.cm.
X	80,000	..	..	3·8	304,000	0 to ½	108	8,100	46,900	½	3·7
						½ to 1	76	22,800		1	3·7
						1 to 2	86	12,900		2	1·5
						2 to 3	55	3,100			
RR	80,000	75,000	77,500	3·0	232,500	0 to ½	270	650	99,000	½	2·2
						½ to 1	240	28,800		1	1·2
						1 to 2*	580	69,600		2	Inappreciable
R	80,000	75,000	77,500	2·0	155,000	0 to ½	72	10,800	51,800	½	7·5
						½ to 1	110	33,000		1	5·3
						1 to 2	39	3,500		2	4·5
						2 to 3	47	4,500			
H	80,000	80,000	80,000	4·1	328,000	..	..	..		1	0·6
										2	0·5
										3	0·3
										4	Inappreciable
										5	"
T	80,000	..	..	3·3	264,000	0 to ½	130	7,800	45,700	½	1·5
						½ to 1	90	27,000		1	0·3
						1 to 2	82	4,900		2	Inappreciable
						2 to 3	80	3,000		3	"
						3 to 4	70	3,000		4	"

* Extra water taken.

highest excretion rate was for the inhalation period itself. Blood values were greatest at the end of the inhalation period, and reasonably well maintained for one or two hours more. The graphs have been constructed from the averages, the abnormal urinary outputs of R.R. being excluded.

CONCLUSIONS

Calcium penicillin administered as a mist is very rapidly absorbed through the respiratory mucous membrane. Highly bacteriostatic titres can be established in the blood in this way. The graph representing the concentration of the drug in the blood at various times subsequent to the inhalation session is in general form similar to and intermediate between those reported by Dawson and his co-workers (1943) for penicillin injected by the intramuscular and intravenous routes.

The wastage of material involved is 60-75%, but the high values obtained in blood and urine encourage the hope that weaker solutions than those employed in this preliminary assay—e.g., 5000 units per c.cm. or even less—could be used economically and successfully for the local treatment of infections of the respiratory mucosa and immediately adjacent tissues, such as purulent bronchitis and bronchiectasis, and as a prophylactic against secondary pyococcal infections in influenza.

This research was carried out under the scheme organised by the Penicillin Therapeutic Trials Committee of the Medical Research Council, to whom we are indebted for supplies of penicillin.

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BACTERICIDAL AND BACTERIOLYTIC ACTION OF PENICILLIN

ON THE STAPHYLOCOCCUS

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In his original paper on penicillin Fleming (1929) recorded the observation that the substance exerted a slow bactericidal action on small inocula of staphylococci in nutrient broth and also had a lytic effect under certain conditions on staphylococcal suspensions of visible turbidity.

In the first comprehensive communication from this department on penicillin (Abraham, Chain, Fletcher, Florey, Gardner, Heatley, and Jennings 1941) the statement was made that this substance was a predominantly bacteriostatic agent. This conclusion was based on the fact that penicillin did not affect the oxygen uptake of resting staphylococcal suspensions even in high concentrations, and on the finding that plate-counts made after incubation of staphylococcal suspensions with penicillin in Ringer solution for 24 hours showed the presence of a large number of viable bacterial colonies.

Hobby, Meyer, and Chaffee (1942) showed that penicillin exerted a powerful bactericidal action on streptococci, pneumococci, and staphylococci when acting under conditions favourable to their growth. Under these conditions 99% of the organisms were destroyed. When it was brought in contact with bacterial suspensions under conditions unfavourable to their growth (low temperature, exhausted culture medium) no bactericidal action was observed. Further evidence confirming these observations was adduced by Hobby and Dawson (1944a and b), who showed that the bactericidal action of penicillin was enhanced by substances increasing bacterial growth, while it was diminished by substances interfering with growth (e.g., saline, sulphadiazine). Miller and Zimmerman Foster (1944) found that penicillin had a similar mode of action on the meningococcus, which was killed by it in a nutrient medium but remained unaffected in a non-nutrient medium. Rammelkamp and Keefer (1943) also noticed a bactericidal action of penicillin on the streptococcus and staphylococcus in human blood.

Rantz and Kirby (1944), using photoelectric turbidimetric methods confirmed the bactericidal effect of penicillin on the staphylococcus in nutrient media, and also Fleming's original observation on the lytic effect of penicillin on staphylococcal suspensions, which also had been noticed by Smith and Hay (1942) and Fisher (1943). They reported that such suspensions incubated with small amounts of penicillin in a nutrient medium show first an increase and later a decrease in turbidity, and finally are completedly lysed.

The bactericidal effect of penicillin [illegible] was also noted by Bigger (1944b and c), [illegible] same conclusions as Hobby and others. He also noticed that 99·96% of the staphyloccoci were killed by penicillin after incubation for 24 hours at 37° C in a nutrient medium and gave the term "persisters" to the small percentage of *organisms surviving under these* conditions.†

In view of the above results it was decided to attempt to demonstrate the bactericidal action of penicillin manometrically by its effect on the oxygen uptake of growing staphylococcal cultures; it was hoped that more detailed knowledge about the mode of action of penicillin *might be gained from such metabolic experiments.* The manometric measurements were complemented by photoelectric turbidity measurements, hæmocytometer-counts and viability-counts.

EXPERIMENTAL DETAILS

Bacteria.—The Oxford staphylococcus (H) strain was used throughout the work, apart from a few experiments made with a resistant strain isolated from a human infection and with a stock culture of a β-hæmolytic streptococcus. The organisms were first grown in Lemco broth with continuous shaking in Erlenmayer flasks for 14–18 hr. at 37°. Suspensions of about 3000 million organisms per c.cm. obtained in this way were diluted in fresh heart broth to the desired density. In all experiments not carried out in Warburg vessels the organisms were shaken in 4 c.cm. amounts in 25 c.cm. Erlenmayer flasks. This gave homogeneous suspensions suitable for hæmocytometer- and viability-counts, and without any of the irregularities found when unshaken suspensions were used. In particular the "bacteriostatic" end-point was clearly marked. Occasionally the bacteria showed a tendency to grow in clumps and to adhere to the sides of the vessel, a mutation similar to that described by Rochaix and Rivollier (1939); such cultures were not used.

Measurement of oxygen uptake was done in ordinary Warburg vessels with one side bulb and a central chamber for the absorption of the respiratory CO_2 at 37°. Two c.cm. of each bacterial suspension was placed in the Warburg vessels, and the total volume of fluid brought to 2·5 c.cm. by additions of KOH, penicillin solutions, &c. The atmosphere in the vessels was air. The number of bacteria in the staphylococcal suspensions used was established before the experiments by hæmocytometer-counts.

Viability tests were carried out in the usual manner by plate counts on heart broth agar (after suitably diluting the suspensions). Penicillinase-containing agar was used when the initial penicillin concentrations were high.

Penicillin.—The preparation used throughout the work was a commercial product manufactured by Chas. Pfizer and Co., Inc., USA, containing 500 Oxford units per mg.

Effect of Penicillin on Bacteria in Various Phases of Growth

I. STATIONARY PHASE

The result previously obtained (Abraham et al. 1941) that penicillin had no effect on the oxygen uptake of resting bacteria was first confirmed (table I). An 18 hr. unshaken culture in Lemco broth containing 700 million organisms per c.cm. was used. Viability-counts were made from the suspension containing the

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* With a personal grant from the Nuffield Provincial Hospitals Trust.

† Since the work reported in this paper was concluded two further papers on the mode of action of penicillin have appeared (Garrod 1945, Todd 1945), which confirm that penicillin exerts a bactericidal and bacteriolytic effect.

TABLE I—EFFECT OF PENICILLIN ON OXYGEN UPTAKE OF RESTING STAPHYLOCOCCI

Rate of oxygen uptake of 2 c.cm. staphylococcal suspension (c.mm. per 10 min.)	Penicillin content of suspension (units per c.cm.)			
	0	*5*	*50*	*500*
At 0 hours ..	36	36	41	34
„ 2 „ ..	42	46	52	49
„ 3 „ ..	25	25	31	31
„ 4 „ ..	23	21	28	26

strongest penicillin concentration (500 units per c.cm.) and from the control (no penicillin) after 18 hr. incubation; the counts were 780 million per c.cm. with penicillin and 700 million per c.cm. without penicillin. Thus the number of viable organisms had not changed materially even in the presence of 500 units of penicillin per c.cm.

II. EARLY LAG PHASE

Respiration-rate and number of viable organisms.—A very different picture is obtained when the effect of penicillin on the respiration of staphylococci is studied under conditions favourable to their growth. For experiments of this type it is necessary to use bacterial suspensions of a density low enough to allow the organisms to go through several divisions, yet sufficiently high to show measurable oxygen uptake at the beginning of the incubation period. Using heart broth as a growth-supporting medium, a suspension of 150–200 million organisms per c.cm. was found suitable. Staphylococci multiply well in this medium at 37° after a lag period of about 30 min. to 1 hour.‡

In fig. 1 is shown the effect of adding various concentrations of penicillin at the commencement of the lag phase on the respiration-rate of staphylococcal suspensions in heart broth containing 150 million organisms per .cm. In the presence of small amounts of penicillin 0·01–0·1 unit per c.cm.) there is an initial rise in metabolic activity of the same order as in the control suspenion containing no penicillin; then the rate of oxygen uptake steadily decreases to zero or very low values. n the presence of larger amounts of penicillin (1 unit per c.cm.) no initial rise in the rate of oxygen uptake occurs; after a stationary period it drops gradually to zero.

Hæmocytometer-counts run in parallel with the manometric experiments showed a lag phase of about an hour before active cell division took place. The oxygen uptake of the suspensions increased however after about 15 min. incubation and reached a value at the end of the lag phase about 3 times higher than at the beginning of the incubation period. It is thus apparent that a considerably increased metabolic activity takes place at the end of the lag phase. Martin (1932) has

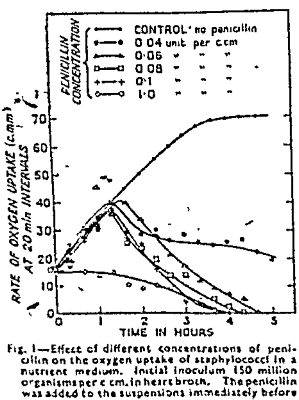

Fig. 1—Effect of different concentrations of penicillin on the oxygen uptake of staphylococci in a nutrient medium. Initial inoculum 150 million organisms per c.cm. in heart broth. The penicillin was added to the suspensions immediately before incubation.

c.cm.) but it is prevented by large concentrations (1 unit per c.cm.).

It is possible to demonstrate manometrically a quantitative relationship between the degree of growth inhibition and the concentration of penicillin by using suspensions of an initial density of about 10 million organisms per c.cm. in heart broth (fig. 2). Such suspensions, which look clear, have no measurable oxygen uptake at the beginning of the incubation period. After 2 hours however the organisms have multiplied sufficiently to show a visible turbidity and a measurable oxygen uptake which increases rapidly with the phase of logarithmic multiplication. Under these conditions a well-marked inhibition of growth and a correspondingly smaller oxygen uptake is obtained with as little as 0·01 units of penicillin per c.cm. (corresponding to about 0·006 μg. of the pure substance); 0·02 unit of penicillin per c.cm. produces very strong inhibition, and 0·03 unit per c.cm. practically complete inhibition of growth and oxygen uptake. These figures were found to be readily reproducible and might provide the basis for a rapid quantitative manometric method of estimating penicillin.§

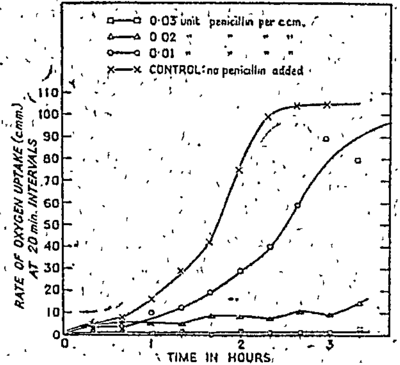

Fig. 2—Effect of different concentrations of penicillin on the oxygen uptake of staphylococci in a nutrient medium. Initial inoculum 10 million organisms per c.cm. in heart broth. Penicillin was added to the bacterial suspensions immediately before incubation.

To see whether the decrease in the rate of oxygen uptake of the staphylococcal suspension in the presence of penicillin was an expression of the bactericidal effect of this substance, viability-counts were made under
comparable conditions table II.
It is obvious that of the
organisms is brought of 0,04
unit of penicillin per c.cm., or higher.

Comparison between opacity measurements and viability-counts.—During these experiments it was noticed that the bacterial suspensions became very opaque after 2–3 hr., but at the end of the experiment, after 6–7 hr., complete lysis had taken place. The changes in opacity were followed quantitatively by taking hourly samples
and deter
the Spek
obtained
units per
by Rantz and Kirby (1944) who used smaller inocula and followed the changes of turbidity over a longer period.

The striking increase in turbidity was at first interpreted as signifying that initial growth of the staphylococci had taken place even in the presence of 3 units of penicillin per c.cm. Hæmocytometer-counts however revealed that the number of organisms had not increased even at the period of maximum turbidity. The increase in turbidity of the staphylococcal suspensions in the presence of penicillin cannot therefore be due to cell division, but must be caused by an increase in the size of the organisms.

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‡ Several samples of heart broth did not support growth in the absence of CO_2. In some cases addition of glucose restored both growth and respiration, but in other samples it was found necessary to add a very small amount of boiled heart infusion in addition to the glucose. With old cultures (incubated at 37° for 24 hr. or longer) the respiration and growth could not be restored even after addition of glucose and heart broth. No additions were found necessary when younger cultures (14–18 hr.) were used.

§ Such a method has been developed since this was written (Hirsch 1943–44; see addendum). It is stated that penicillin concentrations ranging from 0·01 to 0·05 unit per c.cm. can be estimated with reasonable accuracy.

The *viability-counts given in* table II show that even in the presence of very small amounts of penicillin there is no noticeable increase in bacterial numbers when the penicillin is added to the cultures in the early lag phase.[‖] But unpublished experiments by E.P. Abraham show that a staphylococcal suspension to which penicillin is added during the log phase of multiplication can go through about one division after the addition of penicillin. This is not surprising in view of the fact that the bactericidal effect of penicillin is not immediate, but has an induction period of about 10 minutes (see below; action of helvolic acid). Several investigators (Fleming 1929, Hobby and Dawson 1944, Lee, Foley, and Epstein 1944) have recorded that the *number of viable organisms can increase in the presence of* penicillin. The appearance of abnormal and in particular of swollen forms of staphylococci in the presence of penicillin was first noticed by Gardner (1940) and has been confirmed by other authors (e.g., Smith and Hay 1942). Similar morphological changes brought about by penicillin have been observed in other bacteria—e.g., *Salmonella typhi* (Gardner 1940), the meningococcus (Miller and Zimmerman Foster 1944), and the anthrax bacillus (Gardner 1945). The shape of the turbidity-time curves depends on the concentration of penicillin. The maximum turbidity reached in the presence of 3 units of penicillin per c.cm. is not as great as in the presence of 0·3 unit per c.cm., and lysis takes place more slowly. Other factors as yet not investigated in detail affect the speed of lysis—e.g., it was found that lysis took place much more slowly in Lemco broth than in heart broth.

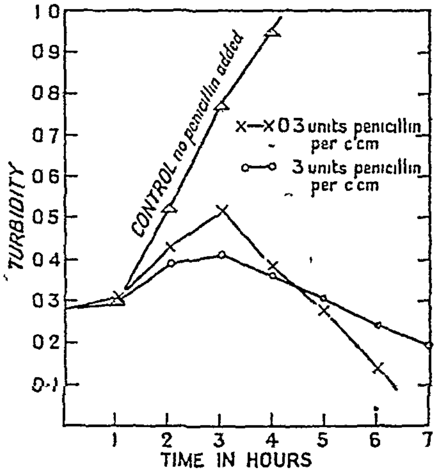

Fig 3—Effect of different concentrations of penicillin on turbidity of staphylococcal suspensions in a nutrient medium. Initial inoculum 200 million organisms per c cm. in heart broth. Penicillin was added to the cultures immediately before incubation. The values for the turbidity measurements represent direct readings on the Spekker photometer.

TABLE II—BACTERICIDAL EFFECT ON STAPHYLOCOCCAL SUSPENSIONS OF DIFFERENT CONCENTRATIONS OF PENICILLIN ADDED TO THE CULTURES IMMEDIATELY BEFORE INCUBATION

Concentrations *of penicillin* (units per c.cm.)	No. of organisms (millions per c.cm.) after—				
	0	*2*	*4*	*8*	*24 hr.*
0·01	193	115	+ + +	+ + +	+ + +
0·02	193	188	135	0·23	+ + +
0·04	193	133	7	0·01	0·005
0·08	193	78	9	0·01	0·002
1·0	193	23	6	0·06	0·001
10	193	8	3	0·04	0·001
100	193	8	7	0	0

+ + + = full growth.

Viability of enlarged forms of staphylococci.—To establish whether the enlarged forms of staphylococci appearing in the presence of penicillin were viable, viability-counts were run in parallel with the photo-electric turbidity determinations. The results (table III) show that there was no correlation between viability and turbidity.

TABLE III—COMPARISON OF VIABILITY-COUNTS AND TURBIDITY MEASUREMENTS OF STAPHYLOCOCCAL SUSPENSIONS INCUBATED WITH PENICILLIN IN THE EARLY LAG PHASE. THE PENICILLIN WAS ADDED TO THE CULTURES IMMEDIATELY BEFORE INCUBATION

Time (hr.)	Concentration of penicillin					
	0·3 unit per c.cm.			3 units per c cm.		
	Turbidity	Hæmocytometer counts	Viable organisms	Turbidity	Hæmocytometer counts	Viable organisms
		(millions per c.cm.)			*(millions per c.cm.)*	
0	0·28	180	..	0·28	180	200
1	0·33	200	214	0·31	168	81
2	0·43	176	161	0·38	160	61
3	0·40	180	70	0·42	160	21
4	0·30	80	34	0·36	126	8
5	0·23	86	32	0·33	116	0·4
6	0·18	24	0·06	0·30	80	0·7
7	0·14	..	0·1	0·20	18	0·8
24	..	1·4	0·001	0·13	1·2	0·004

In the presence of 0·3 unit of penicillin per c.cm. there was no well-marked decrease in the number of viable organisms after 2 hours' incubation, when maximum turbidity was reached. With the higher concentration of penicillin (3 units per c.cm.) there was a pronounced reduction after 3 hr., when maximum turbidity was reached, *and a further considerable reduction after 4 hr.*, when the turbidity had not changed to an appreciable degree. It follows that the enlarged forms are viable for *some time in the presence of small concentrations of* penicillin, but are rapidly killed by larger concentrations. It is noteworthy that the increase in size of the organisms in the presence of 3 units of penicillin per c.cm. is not accompanied by a corresponding increase in the rate of oxygen uptake.

III. PHASE OF LOGARITHMIC MULTIPLICATION

From the fact that penicillin acts on the staphylococci during the lag phase it could be expected that it would also exert an action during the logarithmic growth phase Hæmocytometer-counts and viability-counts show that this is actually the case. A staphylococcal suspension containing 10 million organisms per c.cm. was incubated at 37° C until visible growth had occurred; penicillin (0·1 unit per c.cm.) was then added and hæmocytometer- and plate-counts were made after various time intervals. The results are given in table IV. It will be seen that the number of viable bacteria and the total number of organisms *fell rapidly after the addition of penicillin during the logarithmic growth phase.*

TABLE IV—*EFFECT OF PENICILLIN ON STAPHYLOCOCCI DURING* THE PHASE OF LOG MULTIPLICATION

Time (hr.)	No. of viable organisms	Hæmocytometer-counts
	(millions per c.cm.)	
0	10	10
3*	134	170
5	3	18
9	0·02	0·9
18	0·01	..

* Penicillin was added immediately after these counts were done.

That penicillin acts during the phase of active multiplication as well as in the lag phase can also be demonstrated manometrically. Fig. 4 presents an experiment in which penicillin (final concentration 1 unit per c.cm.)

[‖] In subsequent experiments, when hæmocytometer counts were made at shorter intervals (every 30 min.) it was found that in the presence of 0·05 unit per c.cm. the bacteria went through about one division before being killed. With increasing concentrations of penicillin the numbers of bacteria undergoing division decreased, and in the presence of 3 units per there was no division before death.

was added to a series of staphylococcal suspensions in [illegible] a period of 2 hr.
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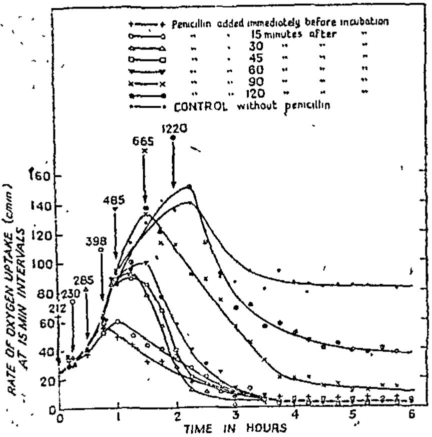

Fig [illegible] times.

1½ hours' incubation the bacterial numbers had increased from 212 to 605 million per c.cm.

Influence of other Antibacterial Substances on Penicillin Action

EFFECT OF HELVOLIC ACID

Hobby and Dawson (1944b) have shown that sulphadiazine slightly retards the bactericidal action of penicillin on streptococci. Bigger (1944b) used dilute solution of boric acid for the same purpose. Probably the most powerful bacteriostatic agent known among antibacterial substances is helvolic acid (Chain, Florey, Jennings, and Williams 1943), which exerts a purely bacteriostatic effect on staphylococci in a concentration of 1:10,000 or less even under conditions favourable to growth ; [illegible] viability
tests. In v [illegible] tion, and
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re presented in the curves of fig. 5 and in table v.
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tant at the
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per c.cm.) was added to the staphylococcal suspensions immediately before putting the vessels into the water-bath, the rate of oxygen
the initial value througho
hr. (curve I). Similar resu
acid was added to the staphylococcal suspensions after they had been incubated with penicillin for 5 and 10 min. (curves II and III). When, however, the addition of helvolic acid to the staphylococcal suspensions was made

TABLE V—TURBIDITY MEASUREMENTS OF STAPHYLOCOCCAL SUSPENSIONS INCUBATED FOR 5 HR. WITH MIXTURES OF PENICILLIN (FINAL CONCENTRATION 0·1 UNIT PER C.CM.) AND HELVOLIC ACID (FINAL CONCENTRATION 1 : 30,000)

No. of tube	Time of addition of helvolic acid	Turbidity
1	Simultaneously with penicillin, before incubation	0·31
2	5 min. after incubation with penicillin	0·29
3	10 " " " " "	0·26
4	30 " " " " "	0·15
5	60 " " " " "	0·14*
6	Incubated with penicillin without helvolic acid	0·14*
7	Suspension before incubation	0·30

* Complete lysis.

after the organisms had been in contact with penicillin for 30 min. (curve IV) or 1 hour (curve V), the bactericidal and lytic effect of penicillin was no longer antagonised. These experiments show that the bactericidal and bacteriolytic action of penicillin does not become effective instantaneously but only after an induction period of not
l
[illegible] easurements of
s [illegible] incubation with
mixtures of penicillin and helvolic acid, the latter being added at various time intervals as described above, confirm the manometric observations. They show that if helvolic acid is added simultaneously with penicillin, or within the first 10 minutes after incubation of the

The results of hæmocytometer- and viability-counts given in table VI confirm the retarding effect of helvolic acid on the bactericidal action of penicillin. In the presence of 1 : 30,000 helvolic acid the number of viable organisms remained stationary for 6 hr. and increased to

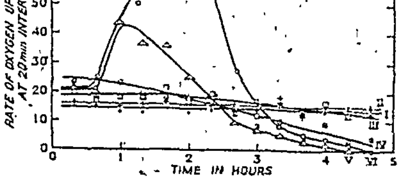

Fig. 5—Effect of helvolic acid on staphylococcal suspensions in nutrient medium incubated with penicillin. Initial inoculum 200 million organisms per c.cm. in heart broth. Final penicillin concentration, 0·1 unit per c.cm.

about 5 times the number after 24 hr. In the presence of 0·1 unit of penicillin per c.cm. the number of viable organisms fell rapidly from 127 million to 1600 per c.cm. in 24 hours. In the presence of 1·0 unit of penicillin per c.cm. and 1 : 30,000 helvolic acid the decrease in viable organisms was much slower, their number remaining

helvolic acid used (1 : 30,000) is not quite sufficient to suppress completely the growth of the staphylococci ; as they enter the growing phase they become susceptible to the killing action of penicillin.

Attempts to obtain similar results with the antiseptic proflavine were less successful. Only a short though definite retarding action of proflavine on the bactericidal and lytic action of penicillin was noticed. Proflavine is not a very suitable substance for these experiments, since it is bactericidal in high concentration and not sufficiently bacteriostatic in low concentration.

TABLE VI—HÆMOCYTOMETER-COUNTS AND VIABILITY-COUNTS

Staphylococcal suspensions incubated with—	Total of organisms (hæmocytometer)				Viable organisms				
	(millions per c.cm.)								
	0	*3*	*6*	*12*	*0*	*2½*	*6*	*12*	*24 hr.*
0·003% helvolic acid added immed. before incubation.	200	200	200	200	127	134	144	198	700
0·1 unit/c.cm. of penicillin added immed. before incubation.	200	52	6	..	127	6	0·06	0·007	0·0016
0·003% helvolic acid added immed. before incubation, and 0·1 unit/c.cm. of penicillin added 30 min. after addition of helvolic acid.	200	200	180	120	127	127	122	59	15

EFFECT OF SULPHANILAMIDE

In view of the wide use of the sulphonamides in conjunction with penicillin therapy it is of obvious practical importance to establish whether the sulphonamides which are generally considered as bacteriostatic agents antagonise the bactericidal action of penicillin in a manner similar to that of helvolic acid. The experiment recorded in table VII shows that sulphanilamide does not interfere with the bactericidal action of penicillin on streptococci. Incidentally it confirms the observation of Wolff and Julius (1939) that sulphanilamide is not merely a bacteriostatic agent but kills the bacteria in the phase of log multiplication after they have gone through a number of divisions. Recently McLeod, Mayr-Harting, and Walker (1944) have also reported that sulphonamides exert a killing action on bacteria in serum broth.

Since sulphanilamide does not prevent the division of the organisms, but acts only after they have gone through several divisions, it would not be expected to interfere with the bactericidal action of penicillin. It has been shown in fact that sulphonamides exert a definite synergistic action in combination with penicillin (Ungar 1943, Bigger 1944a, Soo-Hoo and Schnitzler 1944). We have confirmed these findings in the case of penicillin-resistant staphylococci (table VIII).

TABLE VII—COMPARISON OF THE BACTERICIDAL EFFECT ON *Strep. hæmolyticus* OF SULPHANILAMIDE, PENICILLIN, AND PENICILLIN-SULPHANILAMIDE MIXTURE. THE ANTIBACTERIAL SUBSTANCES WERE ADDED TO THE BACTERIAL SUSPENSIONS IMMEDIATELY BEFORE INCUBATION. THE ORGANISMS WERE GROWN IN 10% SERUM BROTH

Streptococcal suspension incubated with—	Viable organisms per c.cm. after—				
	0	*3*	*6*	*9*	*24 hr.*
Sulphanilamide (0·04%)	120	1705	2976	806	2
0·1 unit/c.cm. of penicillin	120	14	5	2	..
Sulphanilamide (0·04%) and 0·1 unit/c.cm. of penicillin	120	15	4	1	..

Discussion

Our results show that the oxygen uptake of staphylococcal suspensions is strongly inhibited and finally completely abolished by penicillin under conditions favourable to bacterial growth. In confirmation of earlier results no effect of penicillin on the oxygen uptake of resting staphylococcal suspensions could be found. Viability-counts run in parallel with the manometric experiments have shown that the decrease in the rate of respiration of the staphylococcal suspensions brought about by penicillin is due to an actual killing effect. The conclusion of Hobby, Meyer, and Chaffee (1942) that penicillin exerts a strong bactericidal effect on bacterial suspensions under conditions favourable to growth has thus been completely confirmed. It is a remarkable fact that even the most sensitive staphylococcal strain can occur in a phase in which it is apparently completely resistant to the lethal action of penicillin.

There is as yet no universally accepted theory of the mode of action of the sulphonamides. The view at present held by most investigators is that they exert a predominantly bacteriostatic effect (see, for example, the review by Henry 1943). However, Colebrook, Buttle, and O'Meara obtained clear-cut evidence of the bactericidal action of sulphanilamide as early as 1936, and Wolff and Julius (1939) have shown conclusively that sulphanilamide exerts a strongly bactericidal effect on the streptococcus in the stage of logarithmic multiplication, whereas it has no effect on it in the resting condition. Curiously enough their fundamental study seems to have been almost entirely overlooked, apart from a recent note by O'Meara, McNally, and Nelson (1944); it has certainly not received the attention it deserves (e.g., it is not quoted in Henry's review). A bactericidal effect of sulphadiazine on the streptococcus in human blood was also observed by Rammelkamp and Keefer (1943). We have confirmed the experimental results obtained by Wolff and Julius. It thus appears that the mode of action of sulphanilamide on the streptococcus has one essential feature in common with the action of penicillin on the staphylococcus—both agents kill the bacteria under conditions favourable to their growth and do not kill them in the resting phase.

TABLE VIII—SYNERGISTIC EFFECT OF SULPHAMEZATHINE IN COMBINATION WITH PENICILLIN ON PENICILLIN-RESISTANT STAPHYLOCOCCI. INITIAL INOCULUM 1 MILLION ORGANISMS PER C.CM. IN HEART BROTH. HÆMOCYTOMETER-COUNTS (IN MILLIONS PER C.CM.) AFTER 16 HR. INCUBATION

Antibacterial substances added to staphylococcal suspension		No. of organisms (millions after 16 hr. per c.cm.)
Sulphamezathine	(0·05%)	44
Penicillin ..	0·1 unit/c.cm.	410
	0·3 „ „	400
	0·6 „ „	200
	0·9 „ „	No visible growth
Sulphamezathine (0·05%) and penicillin	0·1 unit/c.cm.	No visible growth
	0·3 „ „	„ „ „
	0·6 „ „	„ „ „
	0·9 „ „	„ „ „

These experiments were made in Warburg vessels, the respiratory CO_2 being absorbed by alkali

There are however several important differences in the modes of action of penicillin and of sulphanilamide. One of these is observed in the fact that penicillin is capable of destroying the bacteria in the early lag phase before actual cell division has taken place, whereas sulphanilamide exerts its bactericidal action only after a number of cell divisions have occurred in its presence. Penicillin appears to interfere with a metabolic function involved in the early stages of bacterial development.

It is well established (Topley and Wilson 1936, Winslow and Walker 1939) that growing bacteria are more sensitive to the action of antibacterial agents such as heat, ultraviolet light, &c. than resting bacteria. The analysis of the mode of action of penicillin on the staphylococcus and of sulphanilamide on the streptococcus has provided two further examples for the existence of profound differences between "growing" and "resting" phases, which it may be profitable to study in greater detail from other aspects (immunological, metabolic, &c.).

Since penicillin kills bacteria only under conditions favourable to growth, it is to be expected that substances inhibiting bacterial growth will antagonise the bactericidal and bacteriolytic effect of penicillin. That this is actually the case has been demonstrated clearly by the fact that the powerful bacteriostatic antibiotic helvolic acid strongly antagonises both the bactericidal and bacteriolytic effects of penicillin. It is both possible and probable that conditions occur in the body under which staphyloccoci (and other bacteria) may be in the resting state and thus be insusceptible to the action of penicillin. It is therefore important to give close attention to factors which may bring about these con- [illegible] in dead tissues, [illegible] of Rantz and Kirby (1944), and of Bigger [illegible] a staphylococcal suspension over 99% but not all of the organisms are killed by penicillin, has been confirmed. On the basis of these observations Bigger (1944a, b) has outlined a method of penicillin therapy ("intermittent sterilisation") which is apparently based on the analogy with the "tyndallisation" of sporing cultures. But there is as yet no convincing evidence that penicillin ever prevents staphylococci entering the growth phase, and consequently there is as yet no reason for abandoning the usual therapeutic procedure of giving penicillin continuously until the infection is sterilised. The factors responsible for the survival of a small percentage of organisms apparently resistant to the bactericidal action of penicillin are not yet understood.

There is no conclusive evidence that penicillin can exert a purely bacteriostatic effect under any conditions. [illegible] that it owes its [illegible] activity to the [illegible] ly bacteriostatic. The only other effective antibacterial chemotherapeutic [illegible] shown [illegible] when very small infecting inocula were used.

In view of the fact that the sulphonamides allow bacteria to undergo several divisions in their presence before exerting their bactericidal action, they would not be expected to antagonise the antibacterial action of penicillin. In fact, a synergistic action of sulphonamides in combination with penicillin on penicillin-sensitive streptococci has been observed by various workers, and these observations were extended to penicillin-resistant strains of staphylococci in this paper.

Fleming's (1929) original observations and the recent reports of Rantz and Kirby (1944) on the lytic effect of penicillin on staphylococci have been confirmed and the conditions for the occurrence of lysis have been investigated. Lysis of the staphylococci by penicillin is dependent on the medium and the concentration of penicillin; it occurs readily when a suspension of a density of 200 million organisms [illegible] amounts (0·01–0·1 [illegible] lysis of the organism [illegible]

Though penicillin [illegible] bactericidal agent, [illegible] common antiseptics [illegible] properties, and still occupies an unique position among the known antibacterial agents. Its activity is very great; as little as 0·01 unit per c.cm. (corresponding to about 0·02 μg. of the pure substance) is sufficient to kill and dissolve 200 million organisms. This is an activity of the same order as that of highly active enzymes; it suggests that penicillin is either a part of an enzyme or acts by setting in motion an enzymatic mechanism.

ADDENDUM

While this paper was in the press a publication of J. Hirsch (1943–44) on the mode of action of penicillin came to our notice. Using manometric methods he has studied the effect of penicillin on the respiration of staphylococcal suspensions. His results are very similar to our own as far as the shape of the oxygen uptake curves in the presence of penicillin is concerned. No hæmocytometer counts were given, however, and therefore a reliable correlation between rate of growth and oxygen uptake is difficult. Hirsch has interpreted all his results on the assumption that the rate of oxygen uptake strictly runs in parallel with the rate of growth of the organism. This assumption is valid only under strictly defined and limited conditions. His experi- [illegible] multiplication, and that bacterial growth always continues at its normal rate for some time after the addition of penicillin.

Summary

The oxygen uptake of staphylococcal suspensions in different phases of their culture cycle has been measured in the presence of penicillin. During the "resting" phase even large concentrations of penicillin have no [illegible] he early [illegible] plication [illegible] eventu- [illegible] suspen- [illegible] unit per c.cm.). The effect is not immediate but sets in after an induction period.

Hæmocytometer and viability counts run in parallel with the measurements of oxygen uptake show that penicillin has a strong bactericidal effect on staphylococcal suspensions in the early lag phase and the logarithmic phase of multiplication but no measurable bactericidal effect during the resting phase. The observation of Hobby, Meyer, and Chaffee (1942) that penicillin kills [illegible] no bactericidal action [illegible] lly confirmed.

[illegible] spension of 200 million staphylococci per c.cm. in a nutrient medium during the early lag phase, the turbidity increases about twofold during the first hour of the incubation but the total number of organisms remains constant. The increase of turbidity under these conditions is attributed to swelling of the organisms.

Penicillin is capable of exerting a bactericidal effect on the staphylococcus before actual cell division has [illegible] of multiplication. Penicillin appears to interfere with a metabolic function involved in the early stages of [illegible] mezathine, which do not prevent the occurrence of at least several cell divisions, have no antagonistic action on the bactericidal effect of penicillin on the staphylo- [illegible] e, on the contrary, [illegible] well-marked with [illegible] strains of staphylococci.

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MICROSCOPICAL EFFECT OF PENICILLIN ON SPORES AND VEGETATIVE CELLS OF BACILLI

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PENICILLIN was originally described by Fleming (1929) as an antiseptic because he found that his culture-filtrates of *Penicillium notatum* killed and lysed suspensions of sensitive bacteria in fresh nutrient broth. The Oxford team however, when they took up the matter ten years later and established penicillin as a chemotherapeutic agent (Chain et al. 1940), interpreted their experiments as showing an inhibitory rather than a bactericidal action, since the drug failed to stop the respiration of "resting" bacteria, appeared incapable of sterilising cultures or suspensions in non-nutrient fluids, and, under the experimental conditions employed, gave no lysis. A little later, a bactericidal action was re-established by Hobby et al. (1942), who showed also that it occurs only when the bacteria are multiplying, and this has subsequently been confirmed by others (see refs. in Chain and Duthie 1945).

This limitation of the bactericidal effect, combined with the fact that complete sterilisation is seldom achieved, seemed to provide a synthesis of the two apparently conflicting views. The subject was therefore reinvestigated by Chain and Duthie, who have fully confirmed this reconciliation, establishing also some important new facts about the mechanism of the action. At the same time the following observations were made with the aim of discovering at what stage of growth the cells are attacked.

It had been previously suggested (Gardner 1940) that weak penicillin, while not entirely preventing growth, inhibits division. In order to see how early in vegetative growth an effect could be observed it seemed best to start with spores, to which the otherwise dubious term "resting cells" can certainly be applied, and which are clearly all in the same phase of life.

METHODS

Spores from ancient cultures with no living vegetative cells were spread on the surface of a nutrient agar block (Med. Res. Coun. 1931) containing penicillin. They were then covered with a coverslip, incubated, and observed at intervals. In most experiments the positions of a number of separate spores were charted so that their individual response could be followed.

A few observations were also made on vegetative cells, and some quantitative tests of the rate of killing of spores in strong penicillin-broth were made by repeated platings on agar containing penicillinase. The species of bacilli used were *B. anthracis*, an avirulent stock culture, and *B. subtilis* (3 R 9675), both fully sensitive to penicillin.

(1) *Anthrax and subtilis spores on weak penicillin-agar (0·1 to 1 0 unit per c.cm.).*—In half an hour or so at 37° C spores of *B. anthracis* show a pregerminative change, losing their high refractility, and enlarging a little. These small ovoid cells then swell more and more, and instead of growing out into rods, as they do if no penicillin is present, they become large spherical "coccoids," some of which can afterwards be seen to burst and disintegrate, leaving either "ghosts" or a little mass of granules. This final lysis may take three to five hours at 37° C, and may lead to virtual (incomplete) sterilisation, or to a variable degree of reduction of viable cells, according to the concentration of the penicillin. In subinhibitory concentrations one may see evidence of division of the coccoids before lysis, and also a few cells which have managed to germinate into curved and distorted rods, some of which are doubtless capable of reproducing the normal form.

Analogous appearances were seen with *B. subtilis*, but the swelling into "coccoids" was much less striking. The spores could be seen to enlarge slightly and lose their high refractility, but in this condition most of them remained until a well-marked loss of opacity, with or without a visible breach of the spore-membrane, gave evidence of lysis. A few larger spherical coccoids could be seen here and there, as in the anthrax culture.

In both species of bacilli, therefore, it is clear enough that even the weakest "inhibitory" dose of penicillin attacks the organism in the early stages of germination and so disorders the process that the great majority of the cells are incapable either of growth or survival.

(2) *Anthrax and subtilis spores on strong penicillin-agar (50 to 100 units per c.cm.).*—Here neither of the two species showed any gross swelling of the spores; but they gradually lost their high refractility, and became empty "ghosts" perhaps rather larger than the original spore. To make sure that these signs of death were real, and to confirm the view that only self-nourishing cells are killed, spores were incubated (*a*) in 100 unit penicillin broth, and (*b*) in 100 unit penicillin saline, and quantitative platings were made at intervals to determine the survival-rates. The numbers of spores varied in different experiments from 75,000 to 240,000 per c.cm. of the suspending medium. It was found that whereas there was little or no reduction of viability in the penicillin-saline even after 24 hours, in penicillin-broth 80–90% had been killed in three or four hours, and in 20 to 24 hours 90–99·9% were dead. The action is slow, the first hour of incubation causing no reduction in the "viable" count, and the second hour only about 50%. Microscopical examinations showed that no visible germination had taken place. The anthrax strain was more sensitive than the subtilis, but neither was completely sterilised. Strong penicillin can therefore kill ungerminated spores; the indications being that the pregerminative preparations for nutrition and growth, induced by the medium, make the hitherto resistant spore sensitive to penicillin.

(3) *Vegetative cells of* B. anthracis *on penicillin-agar.*—Cells from a 24 hours broth culture were spread on nutrient agar containing 1 unit of penicillin per c.cm., and the position and appearance of a number of individuals were charted. When re-examined after two hours at 37° C the great majority of the cells showed a profound change; the previously homogeneous protoplasm had become granular and shrunken, and many cells were "ghosts" with a few granules in an otherwise empty cell-membrane, or were even reduced to a bare relic of debris. Here and there a cell, or a portion of a segmented filament, retained all or most of its original homogeneous structure.

In another similar experiment the cells, examined within an hour, showed considerable swelling; a segmented filament appearing like a chain of giant streptococci. An hour and a half later most of these swollen elements had practically disappeared, leaving a little mass of granules in their place. By the next day, so far as could be seen, all had disappeared.

With penicillin at 100 units per c.cm. no swelling was seen at any time, and the first hour of incubation brought no definite change. But in three hours granulation and ghost-production were fairly widespread. Thus the lytic changes were less pronounced in the strong than in the weak penicillin. Even in the latter there was no evidence of real growth of cells, nor any indication that the division-process is concerned.

(4) S. typhi *on penicillin-agar.*—With 5 units per c.cm. there was good growth in the first two hours of incubation, but the cells were several times the normal length, and the formation of the numerous division-septa was abnormal, irregular long "waists" or constrictions replacing the normal, neat, sharply defined septum. In the next two or three hours the elongation of the cells, without further division, was extreme. Many of them showed spindle-shaped swellings, and in many cases herniation of the protoplasm through the membrane gave rise to large balloons attached to the cell. These could be seen to swell gradually, and later on to lose their opacity and become "ghosts." Meanwhile the cell took on an empty and shrunken appearance. This was clearly a manifestation of lysis.

With weaker penicillin (1 unit per c.cm.) the early growth was more or less normal, the cells being much the same size and form as those in the control preparation. But in five or six hours most of the cells were abnormally long, and many showed the disturbance of division described above. No definite lysis was to be seen, and nothing to suggest that the cells were not still living.

SUMMARY

Strong penicillin in a nutrient medium kills spores slowly, without inducing or permitting germination.

But a preg [illegible] stimulation [illegible] sensitive to penicillin. A few of the spores [illegible] for 24 hours or more.

A minimal inhibitory concentration permits the earliest phase of germination to occur, and then gradually destroys the swollen and distorted germ by lysis. But sterilisation is generally incomplete.

In a non-nutrient medium spores are little, if at all, affected by strong concentrations of penicillin.

The action of penicillin is on *feeding bacteria*, and begins directly they begin to feed In sensitive species it has no particular connexion with multiplication or division; though in the semi-resistant *S typhi* a disorder of division seems to be the minimal effect of feebly antibacterial concentrations.

ADDENDUM

Since writing this paper I have heard from Dr. J. M. Barnes that he had already done some (unpublished) experiments which showed that spore-cultures of *B. anthracis* in penicillin-broth underwent a progressive loss of viability at about the rate described above. I have also made some further observations on the visible [illegible] of the cells before any visible growth or division has set in.

My thanks are due to Dr E S Duthie for providing me with penicillin and penicillinase solutions.

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METAL ANASTOMOSIS TUBES IN TENDON SUTURE

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CUT tendons show a strong tendency to unite, and although this is desirable it is very liable to lead to adhesions to surrounding tissues, even if the ends of the tendon are approximated. The more accurate the approximation the less the adhesions, but if any un- [illegible] in band of [illegible] tissues are loose, these adhesions do not matter [illegible]. Even if the tendons are in synovial sheaths, the adhesions may not cause much limitation of movement provided the sheath is loosely attached to the surrounding tissues. In the case of the fingers and thumb, however, the digital sheaths are firmly attached to the phalanges, and adhesi[illegible] and its sheath in this situati[illegible]ndon to the bone and gross [illegible]nt. Moreover, in the case of the [illegible] is very intricate as one tendon passes through another, and adhesions between the two tendons interfere with the free movements of either of them.

Most lesions of the flexor tendons occur in workmen, and unless good movement and a good return of power can be obtained the finger is best amputated. A stiff and weak finger, the usual result of an attempt at repair, is a source of danger to many workmen. There are, however, some instances where successful tendon repair is of particular value. In some occupations (musicians, &c.) the use of all five digits is essential, and in some cases, where the lesion is of the thumb or of more than one finger, amputation gives rise to considerable disability; an attempt should then be made to repair the tendon.

The problem we have to solve is to attain accurate approximation and union of the cut ends of the tendon, and at the same time to stop the tendency to form connexions with surrounding tissue. Many varieties of technique have been used for this purpose.

Accurate approximation and fixation by Burnell's [illegible] about after-treatment differ on this account. Some surgeons suture the sheath; some open it laterally and leave it open. Light active movements from the start without any splinting are sometimes employed, whereas [illegible]aster for three [illegible] movements. [illegible]ble to give way; with early splinting adhesions are liable to form—consequently most of the cases, whichever method has been employed, have resulted in failures. The principle of fixation of the tendon ends until firm natural repair has taken place, and the principle of maintenance of function by active movements seem to be opposed to one another. An attempt has been made to reconcile the two by the use of a metal anastomosis tube and a two-stage procedure.

TWO-STAGE SUTURE WITH METAL ANASTOMOSIS TUBE

The tubes, into which the cut ends of the tendon can be inserted, are made of fine gauge malleable non-corrosive metal. They are ½ in. long and usually 3/16 in. in diameter. The tube is split in its whole length so that it can be removed later, and it has several holes perforated in its [illegible] other side of the tube. Lately a modified type of tube with kick-up spikes in its lumen has been used so as to avoid the use of sutures altogether (figs. 2 and 3).

Under general anæsthesia an Esmarch bandage and pneumatic tourniquet are applied to the arm, and then the wound is thoroughly cleansed and the surrounding skin shaved. An adequate exposure is essential. The tendon ends are located and then the proximal portion is pulled down as far as possible with the wrist and fingers fully flexed, and transfixed with a straight needle as far proximally as it is exposed This seems to be the best way of holding the proximal end with a minimum of trauma; forceps are liable to cause considerable damage to the tendon. The profundus tendon is essential and this is the only one that is sutured. The sublimis tendon is cut away so as to avoid adhesions between the two. The sublimis tendon apparently only gives additional strength and firmness of grip to the finger.

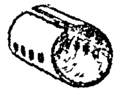
In this way the tendon ends are approximated and held together in a metal tube. The straight through-and-through sutures or the projections prevent fraying of the tendon and the encasement in the tube to some extent prevents undesirable adhesions to surrounding tissues. The tendon ends unite readily in the tube by fine linear scars, and after the tubes have been removed the union is so accurate that it is difficult to make out where the tendon has been severed. Bands of fibrous tissue actually grow out through the perforations in the tube, and these have to be divided at the second stage of the procedure which is undertaken some five weeks later. The original tubes had multiple perforations in them, but the number of holes have now been reduced to four so as to diminish these adhesions. During the [illegible] the finger [illegible]ree weeks, so as to allow union to take place without any strain on the suture line.

The second stage of the procedure simply consists in exposing the tube, removing the sutures (if sutures have been used), and then opening the tube along the line of the slit and removing it from the site of anastomosis. The adhesions that have formed around the tube are divided and the tendon is left completely free. The adhesions are often surprisingly dense, but the encirclement of metal around the tendon does keep the site of anastomosis free. The digital sheath is not sutured at all and the wound is closed by suturing the skin only. Active movements are started next day. At this stage these can be done quite vigorously, without fear of the tendon ends coming apart.

PRELIMINARY CASE-REPORTS

So far only recent injuries have been dealt with by this method and full passive movements of the digits were present before the operation.

Two cases of cut flexor pollicis longus tendon opposite the proximal phalanx of the thumb have been sutured by this method. At the removal of the tube six weeks later adhesions were growing through the small perforations of the tube; these and some fairly dense adhesions around the tube were divided. Flexion deformity of the terminal joint of the thumb developed in both cases, but after persisting with vigorous active movements and wax baths, a half normal range of movement was obtained in one case, and an almost full range of movement in the other.



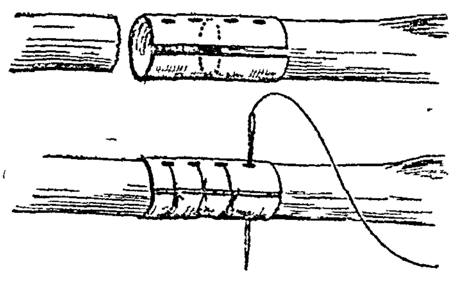


Fig 1—The original method was to use a single split tube with perforations in it, through which sutures could be passed to anchor the divided ends of the tendon.

The third case was of a lacerated palm where the sublimis and profundus tendons of the index finger were completely severed, along with the digital vessels and nerves just proximal to the digital sheath. The sublimis tendon of the middle finger was also completely severed, and there was only one strand holding the profundus tendon of this finger. The suture of the profundus tendon of the index finger by a metal tube was carried out, the sublimis tendon being cut away. The recovery of function in this case was slow and some permanent stiffness of the index finger remained, but it must be appreciated that this injury was accompanied by an extensive laceration of the soft tissues around.

The fourth case was of a cut wrist where all the tendons were severed except the profundus tendon to the 5th finger. The median nerve was also divided. The tendons were identified as far as possible, and the profundus tendons united by the use of anastomosis tubes. The median nerve was also approximated by a similar method, the tube being used to surround the nerve, but the sutures did not perforate through the nerve; they were put in with very fine small curved needles, passed through the edges of the sheath of the nerve and then out through the adjacent perforations of the tube on the same side, and then tied outside the tube. A plaster cast was applied, and at the second stage five weeks later the nerve had united well. The profundus tendons to the middle and index fingers had joined by linear scars, so fine that the actual site of union was difficult to make out, but the tendon to the ring finger had pulled out to some extent, so that the ends were joined by a band of fibrous tissue. The ultimate result of this case was very satisfactory for the index and middle fingers.

The fifth case was of a cut profundus tendon of the 5th finger, opposite the middle phalanx—the site where adhesions are most troublesome. At the second stage union was found to have taken place and the minute bands of fibrous tissue growing through the perforations were divided so as to free the tendon completely. The functional recovery was good but is not quite full.

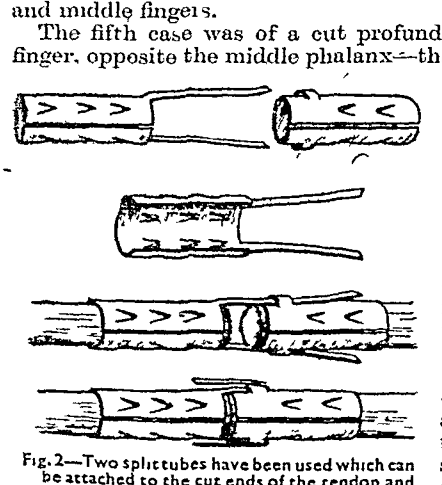


Fig. 2—Two split tubes have been used which can be attached to the cut ends of the tendon and remain there by reason of the small pointed projections (kick-ups) in the lumen. The two tubes can then be connected together and so hold the tendon ends approximated. This method was not very satisfactory owing to the clips, which cause quite a bulge at the sides of the tube.

The sixth case was of a cut wrist, where all the flexor tendons had been severed with the exception of a few strands of the profundus tendon of the index finger. The divided tendons were sutured with the stainless steel anastomosis tubes. The median nerve had also been severed and was sutured with a 'Tantalum' tube. A plaster was applied for 3 weeks but there was some delay in removing these tubes because the patient lived a long way away. She did obtain full movement of the index finger and full passive movement of the other fingers before the tubes were taken out. At the removal of the tubes the tendons had united so well that the line of union could hardly be made out, except in two of them where some separation had taken place and the ends were united by a band of fibrous tissue. This was probably due to the use of forced passive movements by the patient. The median nerve had united well, without any swelling and without the line of union being visible. Since then an increased range of active movement has been obtained, but although useful it is not nearly full.

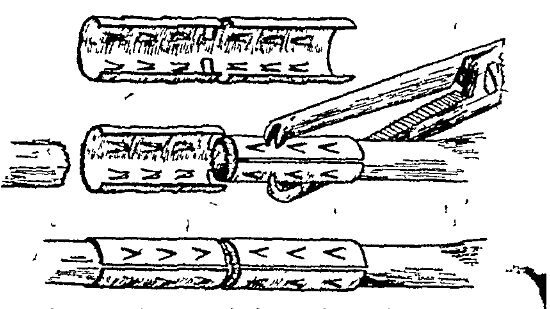


Fig 3—In the latest method two short split tubes with kick-ups are connected by a narrower band. The tendon ends are simply laid in the opened tubes which are then closed around them. They remain anchored by reason of the kick-ups. In this way all sutures and clips are avoided, and the tubes are readily removed at the second stage of the operation by opening up the slit.

Materials used.—In the first two cases, stainless steel tubes and sutures were employed. In some of the others, tubes and sutures of tantalum were employed. The sutures are very fine, being 0·006 in. in diameter and are fixed to a fine straight needle without an eye so as to make an atraumatic suture. Where tantalum was used it was noticed that there was some discoloration of the tissue around the metal and the adhesions were more dense than they were in the cases where stainless steel was employed. The cause of this is not definitely known, for tantalum is supposed to be highly resistant to corrosion, but its undesirable effect here suggests that some ionisation has taken place. Consequently stainless steel has become the material of choice.

CONCLUSIONS

The return of function in this small series of cases treated in the last 18 months has been fairly good. One of the cases of division of the flexor pollicis longus was a complete success and the other a partial failure.

The technical details may require slight modifications in the future. Probably the sutures will be dispensed with and the split tube with little sharp points projecting into its lumen (fig. 3) will be used instead, so as to cause the minimum of trauma to the tendon and prevent any surrounding adhesions from forming near the site of anastomosis. The ideal material has not yet been found, but further experiments are being made with various types of stainless steel and other alloys. In two cases this method has been used to unite the median nerve at the wrist, and the line of union was a fine one without any expansion of the proximal portion, although it is still too early to give details of functional recovery as far as the nerves are concerned.

I should like to thank Sister Strudwick of the Norfolk and Norwich Hospital for her help in dealing with these cases and also Mr. Drew of Messrs. Down Bros. Ltd. for making the tubes. The illustrations were drawn by Mr. Butler of Cambridge.

Medical Research in USA after the War.—"Experience of the past and vision of the future clearly show the need for organisation, coordination, and support of medical research, as of all scientific research, on a national scale," said Brigadier-General S. Bayne-Jones, of the Office of the Surgeon-General, in a recent address at New Haven, Conn. After the war, he thought, there would probably not be the same motivation toward group work for the solution of scientific problems; but it would be essential to arouse or keep at high pitch the present spirit of collaboration and intense application. "The synthesis of half a dozen sciences is in a single puff of DDT powder."

SPONTANEOUS PNEUMOTHORAX AND STAPHYLOCOCCAL EMPYEMA

IN AN INFANT OF 18 DAYS

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THE following case is of unusual interest in view of the rarity of the condition and the patient's unexpected recovery.

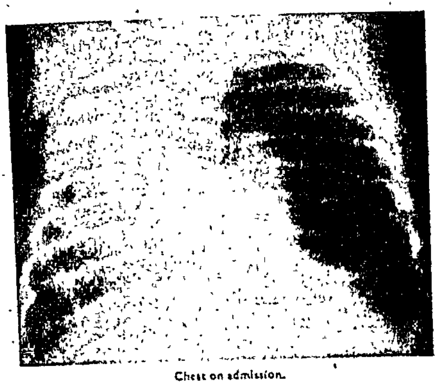
A female infant, 18 days old, was admitted to hospital on April 8, 1944, with a history of one day's cough, difficulty in breathing, pallor, anorexia, and vomiting.

On admission, the baby was dyspnœic and slightly cyanosed; temperature 101·2° F. pulse-rate 146, and respirations 60 per min. There was diminished movement with absence of breath sounds over the left side of the chest. Radiography showed gross displacement of the heart and mediastinum to the right, the left lung collapsed against the vertebral column, and a large collection of air in the left pleura (see figure).

The baby was placed in an oxygen tent and given sulphamezathine 0·5 g. followed by 0·25 g. 4-hourly. The general condition gradually deteriorated and cyanosis and dyspnœa increased, so a needle was inserted into the pleural cavity through the 7th left interspace in the midaxillary line and a large amount of air under tension was slowly released. There followed great improvement in the general condition. However, the next day there was well-marked dullness at the left base and an X-ray film showed a fluid level rising up into the axilla, with air above it, and gross displacement of the heart and mediastinum to the right. On the 11th there was a sudden attack of acute cyanosis and distress, and the baby seemed about to die. An emergency pleural tapping was performed; 10 c.cm. of air was first removed, then came 60 c.cm. of turbid yellow fluid. During this operation the general condition improved dramatically. On the same evening a de Pezzer catheter was inserted into the left chest through a small intercostal incision under local anæsthesia. The pleural fluid grew a pure culture of *Staphylococcus aureus*, so the baby was given 6 g. of sulphathiazole during the next 48 hours and 0·25 g. 4-hourly for 4 days, with gr. 7½ of sodium citrate and gr. 2½ of sodium bicarbonate with each dose of sulphonamide.

The general condition improved steadily from now on and nutrition remained good, although the thick pus draining through the catheter had shown no diminution in daily volume (1–2 oz.) by May 3. It was therefore thought advisable to do a rib-resection under local anæsthesia on that day. The evening temperature remained from the first between 99° and 100·8° F, although the respirations fell gradually to 40–45. On May 12 the hæmoglobin was 57% and on the 13th a transfusion of 4 oz. of fresh whole group O IV blood was given. This raised the hæmoglobin to 72%. The pleural cavity was washed out with eusol through the drainage-tube every second or third day, according to the ease with which drainage was seen to be occurring, until on May 25 some eusol was coughed up [illegible] washed out again after [illegible] up 14 days after rib-re[illegible] be adequate, so a further [illegible] was given from May 18 to 21, after which the rectal temperature never rose above 99·4° F and gradually settled to 99° F. The daily amount of discharge gradually lessened, and on June 16 the drainage-tube was removed.

[illegible] tinued to gain w[illegible] pressed breast m[illegible] She weighed 7 lb. 10 oz. on admission and 10 lb. 3 oz. on July 5, when she was sent home. She has been seen regularly in outpatients since then. Her left lung has re-expanded, she has gained more weight, and the scar is sound.



Chest on admission.

The most likely sequence of events in this case seems to be a primary staphylococcal lung infection with rupture of a subpleural abscess into the pleural cavity, leading first to the formation of a pneumothorax, and then to empyema. Leigh Collis and Foster-Carter[1] reported a somewhat similar case in which at autopsy multiple small staphylococcal abscesses were found in the lung, and one of these was actually seen to communicate with the pleural cavity. It seems probable that in the present case the baby's chances of recovery were greatly increased by her being fed entirely on breast milk.

I am indebted to Dr. W. G. Wyllie for permission to publish this case.

Medical Societies

MEDICAL SOCIETY OF THE LCC SERVICE

A MEETING on May 3, with Mr. G. F. STEBBING, the president, in the chair, was devoted to

Hæmatemesis

[illegible] Ill health due to the ulcer, malnutrition, and associated disease of the heart, lungs, or kidneys had to be taken into account, and he laid stress on the prognostic importance of the patient's age. The prerequisites for operation were a tolerably fit patient, a known and operable lesion, and the availability of expert surgery. He recommended excision, cauterisation, infolding, or ligation as the most useful procedures, the aim being always to find and deal with the bleeding point. In some cases the cause of the bleeding could not be found or might prove inoperable. At St. Andrew's Hospital there had been 27 deaths from hæmatemesis in the last ten years; 15 of these cases were considered inoperable because of associated disease, and of the remaining 12 the diagnosis was unknown at the time of the hæmorrhage in 8, and known or thought to be known in 4. Of these last one man of 59 had been treated for six years for cirrhosis of the liver but was found post mortem to have bled from a large chronic gastric ulcer. In conclusion Mr. Whigham suggested that the ulcer that had bled should be viewed later with a bias towards surgery.

Dr. B. GOTTLIEB spoke of a series of 113 cases of gastroduodenal hæmorrhage treated by him during the last 2½ years at St. Alfege's Hospital. They formed 1% of the total admissions, and he noted a sharp increase in incidence during the flying-bomb attacks. By barium meal or at post-mortem examination the diagnosis was made of gastric ulcer in 31 cases, duodenal ulcer in 40, and acute peptic ulcer in 11, with 1 case each of anastomotic ulcer and aspirin gastritis and 23 cases not certain. He was interested to find that of the 9 cases of acute ulcer examined, 6 had histamine achlorhydria, and 2 were hypochlorhydric: this deficiency might explain why the ulcers did not become chronic. The deaths numbered 11, giving a case-mortality of 9·7%; the rate was 2·4% for patients under fifty and 13·9% for those over that age. Of 10 post-mortem examinations 8 showed chronic gastric ulcer, 1 a duodenal ulcer, and 1 numerous superficial ulcers in the pyloric regions. Of

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1. Leigh Collis, J., Foster-Carter, A. F. *Lancet*, 1940, i, 575.

the fatal cases 7 had confluent bronchopneumonia, and in 2 of these the bleeding had ceased. Bronchopneumonia was present in 3 other patients who recovered; it might be hard to diagnose in the exhausted patient. He recommended sulphamezathine in these cases. Mental confusion, whether due to pneumonia, cerebral anoxia, or vitamin deficiency, he regarded as a very serious complication. Anæmia was not considered an indication for transfusion unless severe shock was present as well. In his opinion surgery was indicated only in recurrent hæmorrhage from a chronic gastric ulcer.

Mr. N. C. TANNER reviewed 391 cases of hæmatemesis and melæna treated at St. James's Hospital since May, 1941, of which 90% were due to peptic ulceration or gastritis. The severest form of bleeding came from erosion of a large vessel; a pulsating clot was seen in such cases at operation. A more general ooze came from an acute ulcer, and the surrounding mucosa sometimes bled when brushed. About half the patients with gastritis had achlorhydria, and these showed a speckled congestion in a thin mucosa; he believed that small erosions in such cases could open a submucosal vessel. Gastroscopy was of great value in diagnosis. As regards blood-transfusion he was inclined to keep a slow drip going in all but the mildest cases. Although transfusion might cause a fresh hæmorrhage, especially if a reaction took place, there was great urgency, which might not be apparent, for transfusion in cases of repeated hæmorrhage. He had standardised the treatment of hæmatemesis at St. James's Hospital in three distinct periods: in the first (193 cases, 10 operations, 19 deaths) operation was avoided whenever possible; in the second (60 cases, 9 operations, 12 deaths) operation was undertaken earlier, with a predilection for gastrectomy; and in the third (105 cases, 11 operations, 9 deaths) early operation was readily undertaken but the simplest method of stopping the bleeding was chosen. Although the second period contained a greater number of aged and unfavourable subjects he considered that the third series, in which the average age of the patient who died was 66, represented the best results, and he intended to continue on those lines. One recent operative success was in an old man of 79 in extremis from repeated duodenal hæmorrhage.

Dr. H. E. S. PEARSON spoke first about hæmatemesis as a symptom of portal obstruction. The common slower gastric form of bleeding seldom seemed to endanger life, but hæmorrhage from ruptured œsophageal varices in long-standing cirrhosis was almost always fatal. The effortless œsophageal type of vomiting was an aid to recognition, and a Miller-Abbott tube could be used to compress the varices if the diagnosis could be made. In hæmorrhage from ulcer a statistical distinction should be made between the cases in which the bleeding stopped after the initial fall of blood-pressure and those in which it continued or relapsed after cardiovascular reaction had set in. Those in the first group almost always recovered. Of 67 consecutive fatal cases of hæmatemesis from ulcer studied in the LCC Central Histological Laboratory a chronic ulcer containing an eroded artery was found in 61. Hæmatemesis of this nature was essentially a surgical problem. Speaking of the importance of early diagnosis in cases of continued bleeding he mentioned the fallibility of the pulse-rate and especially of the hæmoglobin percentage as guides. The collapsing pulse and early mental changes were valuable signs of lowered blood-volume. The needs of the patient and of his ulcer were in conflict, and it was the patient who had gained by recent advances in treatment. It should be the ulcer's turn now, and he recommended operation as soon as the diagnosis of continued bleeding was made.

Dr. F. AVERY JONES (Central Middlesex County Hospital) emphasised the value of gastroscopy of the healing process following hæmatemesis. He had made this examination in 250 cases and he showed illustrations of rapid healing, including an ulcer which had disappeared in five days, as viewed by the gastroscope. He was in favour of operation in recurrent bleeding from chronic gastric ulcers in patients over fifty.—Mr. I. I. PRICE did not believe that ligation of the bleeding-point was likely to stop the hæmorrhage permanently, and recommended a partial gastrectomy, if rapid, or excision and gastroenterostomy.—Dr. A. KAHAN thought the place for surgery to be a small one. In a series of 113 cases treated medically he had had only 6 deaths. He doubted if anxiety played a large part in causing hæmatemesis.—Mr. G. C. DORLING described a case of repeated severe hæmatemesis in which the patient's life was apparently saved by partial gastrectomy.—Dr. W. W. KAY mentioned a case of fatal œsophageal hæmorrhage occurring only 18 weeks after acute hepatic necrosis. Investigation and correction of disordered blood chemistry were of great importance in hæmatemesis, and rectal glucose was useless for malnutrition. He recommended parenteral administration of thiamine and nicotinic and ascorbic acids.

Mr. WHIGHAM, replying, said that he thought that any general conclusions as to procedure should be within the attainment of all and not too much influenced by the results of individual brilliance.

Reviews of Books

Year Book of Radiology, 1944

C. A. WATERS, MD; IRA I. KAPLAN, MD. (Year Book Publishers; H. K. Lewis. Pp. 448. 31*s.* 6*d.*)

As usual, this volume is equally divided between diagnosis and therapy. The material is abstracted almost entirely from American and English work, though European radiological journals for 1943 have been available, in England at least, for some time. In the diagnostic section bone diseases occupy an unusually small place, the most interesting series of abstracts dealing with fatigue fractures. The respiratory and cardiovascular systems are well done, with good summaries on atypical pneumonia. Much new work on angiocardiography in acquired and congenital diseases of the heart is summarised. In the gastro-intestinal tract the numerous papers on abnormalities of the small intestine reflect the increasing importance of radiology in the diagnosis of many obscure abdominal conditions. Dr. Kaplan again contributes a long valuable introduction to the radiotherapeutic section. He is a prodigious worker and his critical survey covers not only the abstracts in this volume but other unabstracted papers. The most important series of papers deals with the treatment of prostate cancer by orchidectomy, diethylstilbœstrol, and radiation. Endocrine therapy in carcinoma of the breast is also represented. Dr. Kaplan still has hope of the egg-white (avidin) treatment of cancer and there are many papers on this subject. Lysozyme, a basic protein of egg-white, is now being considered as an anti-cancer agent. It is a relative of hyaluronidase and it is suggested that this substance is elaborated by the erysipelas streptococcus, and may account for the spontaneous disappearance of malignant tumours following an attack of erysipelas. In the section on chemical agents it is stated that penicillin has a specific action on cancer cells in vitro.

Colorimetric Analysis

NOEL L. ALLPORT, FRIC, research chemist, British Drug Houses. (Chapman and Hall. Pp. 452. 32*s.*)

COLORIMETRIC methods often afford the most convenient, and sometimes the only analytical approach to biological problems. A large number of colour tests have been recorded, but many fail to come up to expectation, sometimes because unsuitable apparatus is used or because limiting conditions are not recognised. This book is orthodox and competent on the inorganic side, and in biochemistry and pharmacy up to date and judicious. It is divided into five sections: metals, acid radicles, substances of biochemical and clinical significance, alkaloids, hormones, and vitamins, and miscellaneous substances. Mr. Allport has probably been wise not to devote space to the description of apparatus, though the advent of photo-electric colorimeters and spectrophotometers of moderate price is already affecting the assessment of colour tests.

TRANSPORT OF WHOLE BLOOD.—The United States Army is now using expendable ice-boxes for exporting whole blood by air to Europe. Made of metal foil on cotton insulating board, they measure 21 × 21 × 25 in., and weigh only 105 lb. when carrying 24 bottles each of which contains about 1½ pints of blood.

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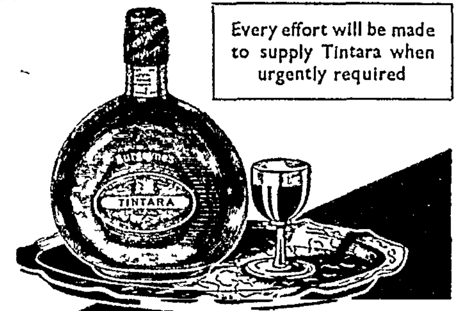

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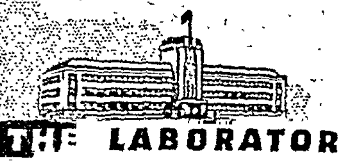

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THE LANCET

LONDON: SATURDAY, MAY 26, 1945

Disability after Head Injury

ALL practising physicians and surgeons are familiar with the postconcussional syndrome, in which a head injury is followed by chronic and seriously disabling ill health which seems to continue indefinitely. Headache, giddiness, nervousness, depression, and loss of mental capacity are prominent symptoms difficult to relieve. It is not surprising, therefore, that both doctor and layman are often highly apprehensive of the possible results of head injury and that many lines of treatment have been designed to lessen the likelihood of chronic disability. There is a fallacy in judging the effect of head injury by the surgeon's personal impressions; for he tends to see only those patients who develop chronic disability, and has no ready means of knowing what proportion of cases make a quick and complete recovery. But head injuries from traffic accidents and falls—not to mention two wars—have become so common during the present century that it is now comparatively easy to find out what the expected prognosis after head injury really is, and to assess the value of various forms of treatment.

In recent years several studies[1] have been made of the subsequent progress of unselected cases of head injury admitted to a general hospital. They usually include all cases severe enough to cause even a short period of unconsciousness, and therefore contain a majority of slight and moderate injuries. These follow-up studies have all shown that the prognosis for the average case of head injury is much better than was at one time thought, and that on the whole quick methods of rehabilitation are advantageous, while long periods of rest and inactivity do more harm than good. Thus, DENNY-BROWN[2] found that 80% of the patients returned successfully to their normal occupation within two months of the injury, and over 90% within six months. The figures for cases with skull fracture were 63% returned to work within two months and 87% within six months. Though the early return to normal life and activity may thus be confidently anticipated and stressed for the average case, it does not follow that these patients are entirely free of symptoms when they return to work. DENNY-BROWN, indeed, found that just over half of his patients complained of symptoms during convalescence. Headache, dizziness, and minor psychiatric disorders were the usual complaints, but they were seldom severe or disabling, and 60% of the series had no headaches at all. A complete absence of postconcussional symptoms is commonly observed even after severe injuries. These figures correspond closely with those of other workers, and it is important that the generally favourable result of moderate head injury should be widely known; for apprehension, whether in his medical attendant or his relatives, has unfavourable repercussions on an anxious patient.

These follow-up studies, though they put the prognosis after head injury in its proper perspective, do not explain the severe disability which follows in a small proportion of cases. DENNY-BROWN, for example, found that mental symptoms related to anxiety were the predominant disability whether the injury was mild or severe, but in his series there were few severe cases—only 23 were disorientated for more than 24 hours. His conclusion, therefore, that intellectual disorder played no significant part in prolonging disability is misleading. It may be true of mild and moderate injuries, but in severe injuries a general loss, or slowing and fatiguability, of memory, power of concentration, initiative, and mental ability are highly important and commonly observed, while personality disorders may be prominent and distressing. Many of these patients lose all pleasure in life and can only be employed on simple tasks. They may not unnaturally develop anxiety, depression, and the associated somatic symptoms. Herein lies the danger that these patients should be regarded purely as neurotic, and the full extent of the underlying physical disability overlooked. The accurate diagnosis of intellectual impairment after head injury is by no means easy, but the gross cases can probaby be recognised by the use of psychometric tests in the way that REYNELL[3] has described. Mild examples of traumatic dementia show the same features as normal old age. Vocabulary, general information, and comprehension tend to be retained, while arithmetical tests, "relational thinking," and ability to recognise abstract relationships are impaired. It is, however, difficult to recognise loss of initiative, mental slowing, fatiguability, change of personality, and the common complaint that memory for names has become much worse. A personal interview with the patient and his relatives or employer about a year after injury probably provides the best basis for assessing the effects of head injury, and there is room for further study of this kind. Even so, the correct balance between the organic and psychiatric effects of injury often becomes a matter of personal opinion. One observer is unduly influenced in favour of organic damage by the long duration of loss of consciousness or the severity of associated skull fractures, while another lays stress on symptoms of anxiety or depression, or an unsatisfactory personal or family history, in labelling the disability chiefly functional. It is obvious that every combination of organic and psychiatric disability may be observed, while a further complication is the likelihood that in some people damage to the highest cerebral functions will unleash an underlying mental instability and thus lead to a psychoneurosis or psychosis directly produced by neuronal damage.

It is only by appreciating these many facets in the clinical problem that fair assessment and guidance of the individual case can be achieved. The patient with severe intellectual impairment gets little sympathy, for his only easily observed disability is general inefficiency in his work and inadequacy in his personal life. This busy world has little patience for his sort, and he should not turn in vain to his doctor for help and advice. On the other hand, the severe sequelæ in these relatively unusual cases should not lead the doctor to give a discouraging prognosis in the general run of head injuries.

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[1] Symonds, C. P., Russell, W. R. *Lancet*, 1943, i, 7. Guttmann, E. *Brit. med. J.* 1943, i, 94.

[2] Denny-Brown, D. *J. Amer. med. Ass.* 1945, 127, 429.

[3] Reynell, W. R. *J. ment. Sci.* 1944, 90, 710.

SQN and SRN

MANY young women who have had practical training of one kind or another will shortly be leaving the Forces. If we fail to attract substantial numbers of them into nursing we shall have lost an unrepeatable opportunity. How can it be done?

A nursing course could be a first-class preparation for marriage and the care of a family, and many girls might be willing to consider it in this light provided it did not commit them to four more years under conditions as restrictive as those they are leaving. In order to overcome the shortage of nursing staff the Government have decided to recruit "assistant nurses," and in our view the present grave situation can best be overcome by making their occupation genuinely and widely attractive. Obviously if it is to attract women from the Forces who do not necessarily mean to make nursing their life-work the course must be both interesting and practical. The new entrant must learn from the start how to make a patient comfortable, and how to perform the nursing tasks which she would have to undertake for a sick person in her own home; there must be no paralysing three months in the sluice-room to spoil keenness, and no boarding-school discipline in the nurses' home to breed discontent. As a student, she should live in a hostel like other students, and come to the hospital not to do the dull chores but to get her training. If there are to be assistant nurses in sufficient numbers, they must not be engaged merely to "help with the rough."

A modicum of theory is of course necessary to anyone working in a modern ward, and the training might begin with a preliminary course in fundamentals; but all the theory should be related as closely as possible to practice. At this stage of her training the student will herself often play the part of the patient, learning much from the mistakes of her fellow learners. She will discover how it feels to be given a blanket-bath by a novice; she will cook invalid dishes and eat them herself. She will become adept at recording pulse, temperature, and respiration. She will learn the principles underlying asepsis by examining under the microscope a smear taken from the ward dish-cloth, from the towel she has just been using, and from the skin of her own scrubbed hands. She will be taught the proper care of the nurse's, as well as the patient's feet; and she will learn as much physiology and anatomy as she needs for a straightforward course in first-aid—about as much, that is, as appears in the Red Cross first-aid manual. When she enters the wards it must be under a ward sister whose backing of trained and competent staff suffices to release her for teaching. From the first the girl must be taught to handle patients, and to carry out all the usual nursing procedures again and again until she is proficient. She will learn bed-making—especially how to make a bed comfortable though neat—how to give an enema, how to turn and lift a patient, how to prevent bedsores and dropped feet, how to cleanse and sterilise the bedpan, how to avoid infection when nursing the tuberculous, and how to dispose safely of their sputum, how to lay infected dust and sweep it up, how to give an injection and put drops in an eye or ear. how to barrier-nurse an infectious disease, how to assist at a minor operation: for all these are things she might sometime have to do for her family. She must also learn to recognise danger-signals—pain in a child's ear, or colic with a rigid abdomen. If at the end of two years of this kind of training a girl of average intelligence is not a competent and handy nurse the fault must be with her teachers.

Is it not possible to carry this principle a little further? The name "assistant nurse" has given pleasure to none and seems to be a hindrance to recruitment to the new grade. Might not this two years of practical nursing constitute the "basic training" for all nurses, suggested by two senior members of the nursing profession and supported in a leading article in the *Times* of May 16? The practical examination at the end of it could then entitle the successful candidate to the title of, say, State-qualified nurse (SQN)—to distinguish her from the four-year-trained SRN. If at the end of her two years' training the SQN decided to go on and take her SRN examination, fresh opportunities might be opened to her. The girls who will wish to take the higher qualification will presumably be those with academic and administrative ability, who are ready to face examinations more exacting than a practical test. Some hospitals might be set aside to train these senior students; for example, some of the medical teaching schools might be staffed only with SRNs and with SQNs in training for the SRN. (This would incidentally have the advantage of ensuring that medical students see and learn from skilled nurses.) These schools for senior nursing students might be affiliated to universities so that the SRN became a university diploma. Moreover, in her final year of training the nurse should be at liberty to specialise in theatre work, tutoring, tuberculosis nursing, orthopædics, or whatever branch appeals to her. A central nursing body might so regulate the prospects in the various branches that there were candidates for all.

This may seem a revolutionary proposal, but in fact it merely realises the possibilities latent in the decision to train a second grade of nurse. The danger at the moment is that the stigma attaching to nursing in the eyes of many prospective candidates will be carried over to the new grade. along with a disparaging name. Only a bold and imaginative stroke can reveal nursing to our young women, now thinking of their future, as the adventurous and satisfying experience it can and should be.

Pertussis Next?

ANY mother who has had to nurse a child with whooping-cough is intensely interested in the possibilities of protecting her family against this protracted and damaging infection, and when she reads in American "digests" of the wonders of prophylactic vaccination, she naturally asks why more is not being done in that way over here. Pertussis is the most crippling and today also the most fatal of childhood fevers, taking its heaviest toll in the first year of life. Thus in the two years 1938–40, over 10,000 children died from pertussis in America; two-thirds of them were under a year old and nearly half of them under 6 months. Thus if prophylactic vaccination is proved to be worth while and is put into practice, it must begin with the 2–3 months-old infant, even though only 10–20% of cases of whooping-cough occur in the first year of life. But, it may be asked, even if vaccination is effective in older children, will it protect the very young infant whose antibody mechanism responds poorly to antigenic stimuli? Some answer to this question has lately come from America.

The efficiency of an immunising agent may be assessed either by testing its protective value among large and properly controlled groups of exposed susceptibles, or by demonstrating the production of specific antibody in the blood of a fair sample of the inoculated community. The first method is the more reliable but is much the more difficult. Both methods have been used to test the potency of diphtheria antigens, and both are being applied in studies of pertussis immunisation. American field trials have shown that large doses of plain pertussis vaccine injected at 3 or 4 weeks' interval can give a considerable degree of protection, while BELL,[1] in a classical investigation, found that two doses of alum-precipitated vaccine with a month between them significantly reduced both the incidence and severity of infection. However, data were needed about such points as optimum dosage and spacing of doses, the relative value of plain and alum-precipitated vaccines, the effect of mixing pertussis vaccine with diphtheria toxoid, and the immunisability of young children. These problems could best be solved by the demonstration, preferably quantitatively, of antibodies in the blood of inoculated children. Thus SAUER and his colleagues,[2] using the complement-fixation test, found that three doses of plain pertussis vaccine (total dosage, 90,000 million organisms) evoked a better response in infants of 7 months and upwards when given at 3-weekly intervals than when given weekly; that the titre of antibody reached its maximum six weeks after the last injection; and that a mixed APT and pertussis vaccine (10,000 million organisms per c.cm.) given in three doses at intervals of 3 or 4 weeks was the best immunising agent. An observation which may be related to the greater potency of combined diphtheria toxoid and pertussis vaccine is the claim by TURNBULL[3] that 61 children, intimately exposed to whooping-cough and already presumably in the incubation or catarrhal stage of the infection, were either protected or developed an abortive attack of the disease as a result of 2 or 3 weekly injections of alum-precipitated diphtheria toxoid alone.

Although SAUER[4] reported that only 27% of infants under 3 months of age developed antibodies to plain pertussis vaccine, compared with over 70% in older infants, SAKO and his co-workers[5] now record more promising results from three doses (0·2, 0·3, 0·5 c.cm.) of an alum-precipitated vaccine containing 40,000 million organisms per c.cm. given monthly to 3793 infants aged 2–12 weeks. In a follow-up of 1834 infants, and using the slide-agglutination technique,[6] they found that 78·2% had demonstrable antibody 2–4 months after completion of the course, while tests on 500 in-

of them

young

ly 8·6%

of 6600 injections were followed by local reactions and 0·6% by sterile abscesses. Systemic reactions occurred after 7·1% of the injections but only 3·4% of them were classified as severe. A paroxysmal cough occasionally developed soon after the injection but disappeared rapidly. Nodulation and sterile abscesses from alum-containing antigens is well known and can be minimised by deep subcutaneous or intramuscular injection of the reagent. SAKO also recommends a different needle for the injection from that used to aspirate the fluid, so as to avoid introduction of the alum intradermally. These local reactions are more likely to worry the injector than the injected, and parents, if warned about them, will regard reactions as a small price to pay if in return both they and their children are saved from weeks of misery—and perhaps worse. As with diphtheria, there is no claim that vaccination against pertussis gives complete protection; but, with a potent vaccine properly used, infection, if it occurs, is attenuated and deaths are rare. The present and urgent need is for a reliable biological test for assay of pertussis vaccines, for with increasing demand there is the risk that poor antigens may appear on the market. Any wide campaign for the prophylaxis of pertussis must start from this point. The country which gave us APT will surely not fail to find a potent pertussis antigen; the need is as great for pertussis as ever it was for diphtheria.

Annotations

DEMOBILISATION AND CALL-UP

WE publish this week an important letter sent by the Central Medical War Committee to all doctors serving temporarily with the Forces. The committee has evidently rejected the proposal, canvassed in our leading article of April 14, that junior men wishing to continue

if (apart from a small number of teachers and others urgently needed at home) doctors are released according to age and length of service as laid down in the Government's white-paper for reallocation of man-power. This policy has the merit of being relatively fair to all parties. On the other hand the profession has been warned that doctors will not necessarily be released in their proper group, because it may often be impossible to dispense with their services. Reallocation of medical man-power will in fact be negligible unless a great many civilian doctors are called up to replace those due for release. The committee proposes to call up not only the recently qualified but also many more senior men, and the age-limit recommended for recruitment is between 35 and 40.

SMALL-GUT OBSTRUCTION

IN many cases the diagnosis of obstruction of the small intestine is obvious, but in others the small intestine begins to pool its contents insidiously, without early vomiting and with only fleeting pain and moderate distension; in others again the continued action of the large bowel may lead the surgeon to exclude intestinal obstruction as a cause of the symptoms. In the postoperative varieties the clinical picture is seldom clear enough to render additional aids to diagnosis superfluous. Thus in the patient with a recent incision abdominal pain, tenderness, and soft distension are not necessarily a danger signal. Moreover, the absence of tenderness in a recently opened abdomen exclude serious trouble within. This is pa

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1. ondon, 1942.
2. er. med. Ass.
3.
4.
5. S. J. J. Amer. med. Ass. 1945, 127, 379.
6. Powell, H. M., Jamieson, W. A. J. Immunol. 1942, 43, 13

with the paralytic intestinal obstruction associated with peritonitis, which may present itself with signs referable to the diaphragm, rather than the abdomen; a raised pulse and respiration rate, associated with poor use and even a little congestion of the base of the lungs, and accompanied by a cyanotic hue probably of toxic origin, may lead the unwary to diagnose an incipient bronchopneumonia or a patchy atelectasis.

With the passage of time may pass the life of the gut, and it is the loss of viability which determines the fatal issue. To reduce the interval between the onset of symptoms and their interpretation as far as possible Koch[1] has made clinical and radiological studies of a series of cases of acute obstruction of the small intestine due to adhesions and bands, and his findings are encouraging. In his hands plain films of the abdomen have given to all intents and purposes a 100% correct diagnosis in any case with a history of 6 hours or more. The diagnosis is based on the demonstration of gas-filled loops of small intestine in the supine position with fluid levels in these loops in the erect position. The normal small intestine shows no gas shadows. With a shorter history than 6 hours the X-ray picture is often negative, but many doubtful or incomplete cases should nevertheless be spared further delay by this simple and speedy method of a couple of bedside films. The interpretation of the radiograms is not so simple that it should be carried out without reference to the clinical findings, as other workers such as Wangensteen[2] who constantly employ this manœuvre join Koch in emphasising. Levitin and Trauner[3] suggest that a negative radiogram is sometimes found in serious strangulation. It may be that such cases, owing to the severity of their symptoms, present themselves before demonstrable gas has formed, but fortunately a strangulation should not cause as much clinical indecision as a simple obstruction. With strangulation the onset is more sudden and the patient more ill; there are signs of peritoneal irritation, tenderness, and resistance; there may be a mass; and there may of course be an obviously strangulated hernia. Levitin and Turner observed that out of 20 symptomless patients who had had laparotomies for various purposes 17 showed gas shadows in the small intestine. On the X-ray evidence they can distinguish between mechanical and paralytic obstruction; in mechanical obstruction a few large loops are continuously distended from the site of obstruction backwards, whereas in the paralytic variety there are multiple scattered small loops of both large and small bowel. Using these criteria they found that many cases of postoperative distension were in fact mechanical in origin, probably due to thin adhesive bands which give way or resolve. Two among their 17 symptomless cases gave such a picture, while of 22 cases of definite postoperative distension 15 showed mechanical obstruction. Six of these were confirmed by operation, 1 by autopsy, and 8 relented (to use Wangensteen's picturesque word) with the Miller-Abbott tube.

The cause of death in intestinal obstruction has been the subject of much experimental work, which Besser[4] has reviewed. The exact nature of the damage to the gut wall in obstruction without strangulation, and the part played by intraluminal pressure have yet to be decided, but it seems clear that toxic substances are absorbed into the blood-stream as the result of such damage. These substances do not form until viability is impaired, which is one of the cogent reasons for haste in diagnosis. When the obstruction is high, fluid and chloride loss are important factors, while in long-loop strangulations blood loss into the loop may play a lethal part. From these facts the principles of treatment emerge. There is of course the relief of the obstruction. Suction on the Miller-Abbott tube may relieve it temporarily, or, as in some postoperative cases, permanently, but surgery is usually necessary afterwards, and although the tube may deflate and help surgery by rendering the field less crowded time should not be wasted in passing it if delay may bring disaster. If there is a suspicion of strangulation operation should wait for nothing beyond essential resuscitation. This will take the form of blood-transfusion to replace plasma lost in the loop, with chlorides in high obstructions associated with much vomiting, and fluids in all cases, usually most satisfactorily administered intravenously. Other forms of tube than the Miller-Abbott require less experience and time for their passage. Some drainage of the upper reaches can be maintained by even gastric suction, and though it will not decompress the whole obstructed length a Ryle's tube will empty the stomach before operation and if continuously used after operation will ease the postoperative course.

INFLUENZA INVESTIGATIONS IN AUSTRALIA

THE latest report[1] of the Walter and Eliza Hall Institute at Melbourne is the first to be signed by Dr. F. M. Burnet as director, and, as might be expected, the account of the work of the virus department is of particular interest. As in previous years during the war, this department has been coöperating with the army. We have already mentioned[2] the field studies on influenza in the winter period as being remarkable for the record of sporadic cases of proven influenza A and B during a season of generally low incidence of respiratory infection. Absence of an actual outbreak of influenza prevented any conclusion as to the efficacy of the immunisation by intranasal inoculation with attenuated virus strains. Beveridge's observations on repeated subcutaneous inoculation with influenza virus preparations were designed to illuminate the known fact that a second inoculation, given within a few weeks of the initial dose, does not induce any further rise in antibody levels. This phenomenon of unresponsiveness was seen even when the interval between the two doses was extended to some months, and failure of response to a first dose was similarly found after a second or third inoculation. Satisfactory explanation of these facts is not forthcoming, but their effect on the interpretation of the results of immunisation is important. Thus it is pointed out that inoculated persons exposed to infection during an outbreak, who may show no further serological change, cannot be assumed to have escaped infection. Their immunisation may have protected "against their ability to show an antibody rise rather than against the disease." This difficulty in interpretation of events does not affect the results of some recent trials of subcutaneous immunisation, including that carried out in the United States in 1943 by the Commission on Acute Respiratory Disease,[3] which was judged on a clinical basis; but it does have a bearing on the serologically negative cases of clinical influenza in other localised or mixed outbreaks and possibly affecting immunised persons.[4] The intranasal influenza vaccine used in Australia has also, thus far, been considered potent because a single nasal inoculation protects against a second spraying, as shown by antibody response; and it is clear that ability to protect against natural infection can no longer be argued from a response of this kind.

In the laboratory, observations have continued on the changes in human influenza strains soon after initial isolation in the chick embryo. The yolk-sac, though less susceptible than the amnion to virus present in gaglings, [illegible] fications. [illegible] (derived) [illegible] B strain, but apparently occurs less sharply than with influenza A. Other work with chick embryos has been directed towards a study of factors concerned in susceptibility to infection which would have a bearing on the problem of isolating new viruses.

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[1] Koch, F. *Acta chir. scand.* 1944, 90, suppl. 88.
[2] Wangensteen, O. H. Intestinal Obstructions, Springfield, Ill., 1942.
[3] Levitin, J., Trauner, L. M. *Surg. Gynec. Obstet.* 1942, 75, 510.
h. Surg. 1940, 41, 970.

[1] Walter and Eliza Hall Institute of Research in Pathology and Medicine. Annual report, 1943–44.
[2] *Lancet*, 1944, ii, 756.
[3] *J. Amer. med. Ass.* 1944, 124, 982.
[4] Horsfall, F. L., Lennette, E. H., Rickard, E. R., Hirst, G. K. *Pub. Hlth Rep. Wash.* 1941, 56, 1863.

In addition to influenza and the common cold, atypical pneumonia and psittacosis are being studied at the institute, with special reference to penicillin. Other subjects of investigation are gas-gangrene, scrub typhus, the effects of heat, and the estimation of carbon monoxide, all of which are important to the war effort in Australia and elsewhere.

POLIOMYELITIS IN MALTA

FROM June 1940 till late in 1942 the islands of Malta, GC, were bombarded from the air with the utmost ferocity. In the areas of concentrated attack large numbers of people were obliged to huddle in tunnels and basements, and later in deep shelters hewn out of the rock; and in the reception areas refugées filled schools, churches, and any other places that could offer protection against the weather. Relief obtained from the building of shelters was counterbalanced by the spreading destruction of homes. In the summer and autumn of 1942 the life-lines became so precarious that the food-supply fell to a dangerously low level. Relief came at last in mid-November. A few days after the people had returned to their homes an epidemic of poliomyelitis broke out. Prof. H. J. Seddon and his co-workers[1] can now tell the story of this outbreak and discuss its epidemiology. The first known cases occurred among civilians in Malta on Nov. 15, and in Gozo on the 21st. The first Service case was on the 27th. The epidemic reached its peak on Dec. 20 (108 cases), and came to an end in the beginning of March, 1943. It is fortunate that Professor Seddon's experience of the Malta epidemic has already been applied: he has gone to Mauritius to advise on measures to deal with a corresponding epidemic of considerable severity, now mercifully on the wane. In Malta there were in all 426 civilian and 57 Service cases; 82% of the total occurred in children under five years of age. Of the 61 adults affected only 4 were Maltese; and a noteworthy point is that no Maltese troops were affected, although they were in close contact with their allies. In the civilian list the mortality was just over 6%, but there were 11 deaths among the 57 Service men.

Poliomyelitis was not a new visitation in Malta; there was a small outbreak in 1902, and between 1921 and 1942 a few sporadic cases appeared nearly every year. The islands are densely populated (Malta 2551 and Gozo 1087 persons to the square mile), and in the special circumstances overcrowding was rife in the autumn of 1942, although the worst period had passed. Nevertheless, there were only seven homes in which more than one child was affected, and none with more than two cases. There was no overcrowding to speak of among the Service men. During the summer and autumn of 1942 the daily adult civilian calorie value of food was never more than 1500 and often less. In the more fertile Gozo, however, overcrowding was relatively low and food fairly plentiful; but the incidence was about the same as in Malta. In considering the mode of spread Seddon and his colleagues point out that the men in the Services did not enjoy the same degree of immunity as the civilians and suggest that this group had not acquired immunity to the strain of virus responsible for the epidemic. There is no evidence that the infection was brought to the islands from without. It was not possible to trace the geographical march of the epidemic and there was no regular connexion between the date of onset in one town and its near neighbour. The evidence of case-to-case infection was rare and uncertain. Studies were made of the possibilities of excremental spread, especially in view of the sanitary difficulties and of the direct use of sewage on the land. The crime-sheets of water and food (especially milk) were carefully analysed, but in vain; and flies were non-suited because of their scarcity at the time. As the outbreak occurred more or less simultaneously in Malta and Gozo, "one is forced to the conclusion that the disease was taken from Malta by one or more carriers." But why need one postulate the carrier from Malta to Gozo? The virus was no doubt widely dispersed through both islands before the disease assumed the paralytic form, and many, though by no means all, outbreaks have taken precisely the same course, affecting in most instances only one member of a family. The virus is constantly with us, constantly infecting us, but only rarely getting through to attack the central nervous system. And the circumstances in which it loses its temper, so to speak, and gores us to the marrow we simply do not know.

THE CRYING BABY

THE cry of the newborn baby has long been recognised as valuable in securing the initial expansion of the lungs, and in the subsequent fortnight its repetition secures full inflation. But the cry is also a warning signal, and Aldrich[1] thinks there is a tendency to forget this in the teaching that to pick up a crying infant is likely to promote "spoiling." The young baby turns on his cry whenever "he is hungry, cold, wet, under the influence of pain; when he hears loud sounds or loses his equilibrium; and probably when he feels the need for fondling." The early compulsive cry may therefore be classified with other disappearing reflexes, like the startle, tonic-neck, grasping, and swimming reflexes, all of which go after a few months and persist only with cerebral retardation. Thus a baby whose early reflex crying persists will come under suspicion as mentally retarded. (So also should the excessively "good" baby who cries very little.) But Aldrich's point is that since the highest mortality-rate in life occurs during the first two weeks anything which will throw light on the best management of this period is worthy of close study. He is worried by the "unresponsiveness and even indifference" shown to the fundamental physiological needs of babies which has undoubtedly grown up in the professional groups caring for them. He makes, in effect, yet another plea that babies need more mothering than the best institutions give them. The baby who is startled, hungry, or cold satisfies his basic needs through the mediation of his cry. He is not to know, as the adults around him know, that modern civilised conditions of life give him more basic security than his predecessors many centuries ago. Modern work among children is rightly putting this sense of security as the most important of all the child's rights. But the newborn still cries, being largely a creature functioning on a subcortical level. A close study of crying in a newborn babies' nursery might yield instructive results and give scientific support to the mother's instinctive response of gratifying the infant's more pressing needs.

TYPHUS IN GREAT BRITAIN

TYPHUS has been diagnosed in 8–10 cases in prisoners-of-war returning to this country. There have so far been no secondary cases, but practitioners are asked to consider the possibility of typhus in any patient with pyrexia of unknown origin who has been in contact with a repatriated prisoner.

ON Thursday, June 7, at 3 P.M. at the University Union, Leeds, Brigadier J. A. MACFARLANE, consulting surgeon to the Canadian Army Overseas, will deliver the Moynihan lecture for 1944. He is to speak on the management and results of war wounds of the abdomen.

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[1] Seddon, H. J., Agius, T., Bernstein, H. G. G., Tunbridge, R. E. *Quart. J. Med.* 1945, 14, 1.

[1] Aldrich, C. A. *Proc. Mayo Clin.* 1945, 20, 69.

Special Articles

RELEASE AND RESETTLEMENT

A LETTER TO SERVING OFFICERS

THE following letter is being issued by the Central Medical War Committee to all doctors serving temporarily with the Armed Forces. It is signed by Dr. CHARLES HILL as secretary of the committee.

DEAR SIR OR MADAM,—This letter is written to you, and to all your medical colleagues serving temporarily in the Forces, with the object of explaining what we in the Central Medical War Committee are doing and planning in connexion with your release from service and resettlement in civil life.

What many of you are thinking and feeling about these things, especially those of you with long service overseas, is fully appreciated. For years you have endured separation from your homes and families. For many of you the years have been largely wasted so far as gaining clinical experience is concerned. If you were recruited a few months after qualifying you may have to relearn your medicine before you start in practice. How, you ask, are you to do it? If you are now married, how can you afford to do it?

Perhaps you left a general practice which has dwindled sadly in your absence. You are anxious to get back to save what you can from the wreck, although you may well need a clinical brush-up first. You know that many GPs who are liable and fit for service, and perhaps younger than yourself, have never been called up. Now, possibly, you have received notice of posting to Burma. Does this mean that your hope of being released when your turn comes must be altogether abandoned? If so, what justice is there in this, when there are so many at home who could replace you?

If you had your foot on the first rung of the ladder leading to consultant practice, how are you to get it back there? What prospects will you have in competition with those who have remained at home and taken the higher diplomas? And why cannot you be allowed to get on with your career now? Why not let the stay-at-homes in the EMS and elsewhere get into uniform and give you a chance to get out of it?

You may have been in one of the public services and may have anticipated that in the normal course you would have secured advancement to a more important post. You may perhaps think that with increasing age your prospects of such advancement are diminishing. Will those who have remained behind have secured, or have a better chance for, all the good posts?

We realise that such questions have been troubling many of you, and although some of your criticisms seem based on insufficient information or even conjecture we want you to know that our sympathies are entirely with you and that it is our sincere intention to do everything we can to help you.

We cannot solve all your problems. We cannot restore to you the lost years; nor even arrange equal shares of sacrifice for all. You will not expect that. What you rightly expect is that, so far as lies in our power, we shall prevent any avoidable addition to the hardship you have already suffered and see that you get a fair deal in regard to release, re-education, and re-employment.

RELEASE

You know about the Government's reallocation of man-power scheme, under which releases will be arranged in groups determined by age and length of service. These releases (class A) will be possible partly owing to a reduction in the strength of the Forces, but partly also as a result of continued recruitment. The white-paper states that one of the objects of continued recruitment is "to increase the releases in class A." In short, the release plan involves an element of replacement. The plan provides also for the retention of a member of the Forces, where necessary for military reasons, beyond the date on which his age-service group is due for release.

When a start has been made with class A releases arrangements will be made for the transfer to civilian employment, out of their turn and with their consent, of [illegible]l number of members of the Forces whose services are urgently needed for work of national importance (class B). *The number of class B transfers will be small in proportion to the number of class A releases.* Persons transferred will not enjoy the same benefits as those released. They will be liable to recall to the Forces if they leave the work for which they were transferred, and they will receive only three weeks' leave with full pay in place of the eight weeks granted to those in class A. Arrangements for compassionate release and for discharge on medical grounds will continue as at present.

No doubt hard cases will occur; but it is generally agreed that the reallocation scheme is as fair as any such scheme could be. We believe that if the Government's plan can be made to apply to doctors as to other members of the Forces you will not ask for more than that. Indeed, we think that, even if the plan could not work completely for doctors, you would accept that position without complaint if you were convinced that we had done everything possible to make it work.

THE DIFFICULTIES

What then are the difficulties? First, the medical requirements of the Forces for the war in the Far East will be such as to make impossible a reduction in strength of the medical branches proportionate to the reduction in strength of other branches. It follows that the replacement element must enter more largely into the arrangements for the release of doctors than into the general release plan; otherwise, a disproportionate number of doctors will find their return to civil life delayed on the ground of military necessity. *In short, the key to the problem of releasing Service doctors lies in the recruitment of civilian doctors.*

But it is not merely a question of finding a sufficient total number of new recruits. A large proportion of the medical officers with a high release priority in class A are senior specialists. If they are to be released in their turn many junior specialists will be needed to replace them. We must therefore find recruits both sufficient in numbers and with the requisite experience in the various professional categories.

Finally, the problem is complicated by the class B transfer arrangement, which will be a continuation of the present procedure for release on the ground of urgent civil need. We think that a number of medical teachers will have to be transferred in class B in the interests both of undergraduate teaching and of postgraduate instruction of released Service doctors. There will be others whose transfer in class B will be urgently necessary—general practitioners, for instance, and tuberculosis officers. And for each officer transferred a doctor will have to be recruited. Our task, then—apart from any necessary continuation of the ordinary recruitment now proceeding—will be to find a large number of recruits, including many junior specialists, to facilitate class A releases; and still more recruits to compensate for class B transfers.

PRESENT RECRUITMENT POLICY

Meantime we are sending to the Forces every man and woman who can be spared. The main source of supply is the pool of young practitioners who have completed A or B2 posts[1] in hospitals. We are continually rejecting applications from these practitioners for further deferment. We rarely allow them, for example, to accept even short-term engagements in general practice, although we receive many urgent appeals for their services as assistants; nor do we grant deferment to enable them to take examinations for higher degrees or diplomas. Because of the importance of keeping up a sufficient flow of recruits to the Forces we examine with great care the applications from hospitals for additions to their establishments of house-officers. For the same reason we refuse to sanction new appointments of other kinds, however important, unless they are absolutely necessary in the public interest.

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[1] "A" posts are occupied for 6 months by newly qualified practitioner [illegible] "B2" posts, which [illegible] are normally held fo[illegible] months only. Similarly, a number of young practitioners on completing "B2" posts, are appointed to senior resident posts—such as that of RSO—designated "B1." The duration of "B1" posts varies. Some "B1" officers are recruited when they have held their posts for one year; the others are recruited, whenever possible, after two years.

We keep a watch on appointments to medical posts overseas. We are doing all this at the cost of very heavy strain on the already dangerously depleted civilian medical services. Many of your colleagues at home are carrying almost intolerable burdens and there are some, both old and ill, who in truth are being worked to death.

We have spent much time in a laborious examination of the general practitioner position throughout the country, the results of which prove conclusively the impossibility of obtaining further recruits from this source until releases of general practitioners from the Services can take place. The public health medical services have been drastically curtailed. The Ministries

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It is true that in the hospital service as a whole, although not mainly in EMS hospitals,[2] there is a considerable number of whole-time residents of the B1 category. Some of these are medically unfit; others are senior members of municipal hospital staffs, comparable in status with the visiting staffs of voluntary hospitals and irreplaceable at the present time; others again, although younger, have had to be retained because of the difficulty of finding sufficiently experienced substitutes, particularly for those engaged in more specialised work such as neurosurgery and plastic surgery. There has been, however, a continuous flow of B1 officers to the Services and every effort is now

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officers retained in civilian practice have made a valuable contribution to the war effort, in the treatment of Service sick and wounded and of air raid casualties and in other ways, and that their retention in this country has for the most part not been a matter of personal choice.

FUTURE RECRUITMENT POLICY

So much for the present position. What of the future? When the reallocation scheme comes into operation the regular supply of young practitioner recruits will still continue. Our aim then will be to arrange the necessary replacement of officers released and transferred by recruiting not only young practitioners but doctors in *all forms of medical work whose continued deferment* will be rendered unnecessary by the return of colleagues from the Forces. No class of practitioner will escape our attention. We shall call up younger general practitioners at present considered indispensable and younger consultants on the staffs of voluntary hospitals. So that this may be possible it has been recommended to the Government that the limit for age of continued recruitment of doctors should be between 35 and 40, although the Government have announced that recruitment generally will proceed only up to the age of 25 or, if necessary, 27. We have every hope that the Government will accept this *recommendation*. The replacement of returning specialists will be arranged by the recruitment both of young consultants and of the B1 officers referred to above, many of whom are of graded specialist status.

Transfers in class B will be recommended only in circumstances of urgent necessity. At present we reluctantly reject many appeals for release on the ground of civil need which we should much like to support. We shall continue to scrutinise all such applications with great care and approve them only when a very strong case has been established. Class A releases will be our *first concern*.

We are determined to do everything possible to ensure that retention of individual medical officers because of military necessity is kept minimal. We think that, even if you are now bound for Burma, you need not conclude that you will have to stay there beyond the proper date for your release. Our task is certain to be difficult, but we have no reason to believe that the difficulties will prove insuperable. We promise that, by every possible means of recruitment, we shall do our utmost to see that both repatriation and release take place at the appointed times.

POSTGRADUATE TRAINING

Credit is due to the British Medical Association for having urged the Government, so long ago as the autumn of 1941, to arrange suitable postgraduate training facilities for medical officers in need of professional re-education on release from the Forces. More recently we have done our best to reinforce the efforts of the BMA. *The Government have now announced their* proposals, and we understand that details are being issued through Service channels for the information of all serving doctors.

The plan provides for three classes of medical officers. Class I comprises those who joined the Forces within a year or so of qualification. If you are in Class I, you will probably wish to obtain some further hospital training. We thought that you would welcome something more than a course of lectures and demonstrations or an opportunity of attending the practice of a hospital as a clinical assistant. We recommended that you should be given a responsible hospital appointment at a suitable salary. The Government's plan offers you a post of the junior B1 category for a period up to six months. If you were recruited after obtaining a diploma and wish to proceed to a university degree you will be placed if possible in a teaching hospital. You will be paid at the rate of £350 a year, with board and lodging or an allowance in lieu at the rate of £100 a year. This is not generous pay for a man with family commitments, but such a man may apply for financial assistance under the "Further Education and Training Scheme."

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mean that no man will be prevented from accepting one of these posts for financial reasons. A class I officer studying for a qualification such as the DPH and not holding a salaried post may apply for a grant under the Further Education and Training Scheme.

Class II consists of those who were established in general practice before joining the Forces. If this is your position you will be offered a refresher course, which you may take at any time within a year of your release. No fees will be charged, and travelling and subsistence expenses will be refunded by the Ministry of Health, together with the expense of paying a locum where necessary. The courses may be either concentrated into a period of two weeks or spread over a period of about three months on, say, two afternoons a week. Here again the plan falls short of what we wanted. We strongly recommended that you should be offered a longer course, but the length proposed is all that the Government consider practicable.

In Class III will be those medical officers who were training for a specialist career when they joined the Forces or are regarded as suitable for such training on their release. For them there will be posts of the "registrar" type in teaching and other hospitals. These will usually be posts in the senior B1 category, at a salary of £550 a year, with board and lodging or £100 in lieu. Many of them will be new posts, specially created to facilitate your specialist training.

All the arrangements will be made by the universities in accordance with the long-term policy for postgraduate medical education recommended in the Goodenough report. If you wish to avail yourself of the facilities offered you should apply, on your release, to your university or medical school or to the university nearest to where you are living, or to one of two central offices to be set up in London and Edinburgh. Further details will be announced later.

Some class III officers gained higher diplomas before they were recruited or have done so while serving, but many have had no opportunity of taking the exam inations. We are asking the examining bodies to consider the possibility of modifying the existing examination regulations for candidates now serving overseas and, in particular, to do everything possible in the way of recognising a candidate's medical work on service as satisfying the requirements for admission to the examinations.

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[2] In the EMS in England and Wales there are at present approximately 110 B1 officers fit for military service who have held their posts for two years or longer and about half as many again who have held their posts for one year but less than two years.

SENIOR APPOINTMENTS

In 1939 the BMA urged all hospital authorities to adopt the policy of making appointments to the consultant and specialist staffs on a temporary basis during the war and for one year thereafter. We believe that this is the right policy, although we are well aware of the fact that it does not completely protect the interests of the Service doctors. The BMA recommendation has been adopted to a very large extent. So far as voluntary hospitals are concerned, even temporary appointments of younger men to the visiting staffs have been infrequent, for such appointments would usually be made by promotion of B1 officers and our policy has been to recruit these officers on the termination of their B1 posts. It recently came to our notice that a considerable number of permanent appointments had been made to senior posts in the mental hospitals service. We have made repre- [illegible] this to the Board of Control and the [illegible] Association.

It has been the consistent policy of the Ministry of Health to encourage local authorities to make temporary appointments, and since May, 1943, the filling of vacancies in the public health and school medical services has required the approval of the Ministry of Health, which sanctions a permanent appointment only in the most exceptional circumstances and has not in fact sanctioned any permanent appointment of a senior nature during the past two years. A similar policy has been adopted by the Department of Health for Scotland.

While we think that a permanent appointment may be justified in exceptional circumstances, we have suggested to the BMA the desirability of repeating its 1939 recommendation at this stage and of urging that, when a permanent appointment is regarded as necessary, the time allowed for the receipt of applications should be such as to permit of candidates serving in the Forces overseas being considered. The BMA is acting on this suggestion. We have considered the possibility of recommending rejection of advertisements of permanent appointments not available to Service doctors but we are advised that legal considerations make this impracticable.

SUMMARY

To sum up—we believe that the fair way of arranging the release of medical officers is the way proposed by the Government for the Forces as a whole. In the special case of medical officers a disproportionately large number of new recruits will be required to enable releases to be effected in accordance with the Government's plan. For this reason we hope to obtain authority to continue recruiting civilian doctors up to a limit of age between 35 and 40. Our intention is to call up, not only the recently qualified practitioners, but also many older practitioners (including general practitioners, junior consultants, and B1 hospital officers) who cannot be spared at present but will become available in exchange for returning Service doctors. We shall do our utmost, by the widest possible measures of recruitment, to facilitate both repatriation and release at the proper times. We have tried to secure for you a generous provision of postgraduate facilities, and we hope that the Government's proposals will go a long way towards meeting your need for further professional training although in some respects they fall short of what we asked for on your behalf. We are doing what we can to promote your interests in connexion with higher examinations and senior appointments. We shall welcome any practicable suggestion as to how we can do more.

CHADWICK TRUST.—At 2.15 PM on Tuesday, May 29, at 26, Portland Place, London, W1, Sir William Collins will present the Chadwick prize of £100 and a gold medal to Surgeon Captain S. G. Rainsford, RN. Afterwards Mr. Eardley Holland, FRCOG, will give a lecture on the importance of a maternity service in the life of the nation.

RETURN FROM GERMANY

FROM OUR OWN CORRESPONDENT

(Concluded from p. 636)

THE plans for the Military Government of Germany after military victory were made some considerable time ago. The main duties of that government are concerned with the control of German industry, with the administration of local and national government, and with the problems arising out of the surrender of the armies and other armed forces. But it was known that the many millions of displaced persons—more quickly and equally accurately described as slaves—would present great and immediate difficulties. Industries, public works, military works, and agriculture were carried on very largely by slave labour.

Displaced persons—DPs as they are usually called—fall into two main classes (1) those needing repatriation to the west (the French, Belgians, and Dutch) and (2) those needing repatriation to the east (Russians, Poles, Czechs, Slovaks, and Yugoslavs). There were of course slaves of other nationalities, including, for example, a few deported Britons from the Channel Islands, and some Greeks; but the numbers were relatively small. It was calculated at the end of April that there were in all zones over 2 million French DPs requiring repatriation to France, 365,000 Belgians, and 336,000 Dutch.

Of these west-bound nationals about a million were in the British zone of occupation, roughly corresponding with the area under the control of 21st Army Group. And in 21st Army Group area there were also thought to be 1½ million east-bound nationals—Russians, Poles, Czechs, Slovaks, and Yugoslavs. In the Russian zone further east the number of east-bound nationals must be very great, as also in the American zone to the south.

The problem for 21st Army Group area was to send west-bound DPs home as quickly as possible and to create permanent camps east of the Rhine in which east-bound nationals could be housed pending arrangements for their transport to their countries of origin.

ARRANGEMENTS FOR DISPLACED PERSONS

The collection, accommodation, and housing of the 2½ million people in the 21st Army Group area was a very big problem and an urgent one. Especially as it was expected that epidemic diseases would be found. Before military conquest was achieved, it was very hard to estimate what food stocks and what camps, houses, or shelters would be available.

Before our armies moved across the Rhine it was anticipated that pari passu with our advance there would be a mass movement of displaced persons, released by military operations, towards and over the Rhine wherever crossings could be made. Obviously, an uncontrolled mass movement might have so congested roads and bridges as to hamper seriously all military operations by interfering with our train of supply. An uncontrolled mass movement might also threaten disorder and the spread of epidemics in Europe west of the Rhine.

To prevent this mass movement thousands of leaflets, in the languages required, were dropped by air and issued by every other possible means, urging the displaced persons to stand fast until food and help could be brought to them. It was realised that this exhortation would not entirely stop mass evacuation, but it was hoped it would lessen it; and probably it did so.

Nevertheless preparations were made to deal with mass evacuation on a grand scale. In the first period of our operations, when the area conquered was on the other side of the Rhine, a series of posts was established on the line of the rivers Rhine–Ijssel immediately after our troops had themselves crossed over. The rivers were patrolled, the bridges were guarded, and the DPs were directed to one or other of eight camps at eight of the main crossings where they could get food, shelter, and any necessary medical attention.

As the armies moved forward they had to cross other river barriers, the Dortmund–Ems canal, the Weser, and finally the Elbe. At each of these barriers the same routine was followed—patrolling of the waterway, guarding of the crossings, and sending of DPs to collection camps. It is quite true that a determined DP, intent on avoiding any control, could in one way or another avoid the camp and rampage around by himself. But why? When slaves were first liberated some naturally turned on the masters who had brutalised them. Farmers were murdered, women raped, food stolen, cattle injured or killed. But the surprising thing is not that these incidents occurred, but that they did not occur on a very big scale. Probably most of the slaves were too devitalised by deficient feeding to have the energy for vengeance.

Once the Rhine had been crossed, military police controlling Army traffic were instructed in the further duty of controlling DP traffic. Notices in many languages were posted up telling the DPs which way to go. And at each assembly centre they were assured of *something to eat and somewhere to sleep.*

When the assembly centres were first established, immediately after an area had been cleared by fighting, they had to be improvised; but the administrative kernel of Military Government personnel was available, and there were the resources of Army Medical Services, Engineers, Ordnance, and other services to call on. These centres grew steadily by provision of sanitation, supply of water, procurement of accommodation—sometimes by taking over buildings, sometimes in tents—and procurement of stores. When each centre had expanded to what was considered its maximum capacity, then satellite centres were set up on the same lines.

DPs generally run their own camps, with the minimum of military help, under the control of the Military Government detachment. Where possible, DPs of each nationality are grouped together, and usually formed into sub-groups of about 30 persons under a leader appointed by themselves to act as a channel of communication.

MANAGEMENT OF DP CAMPS

Food.—The Germans on the spot, in town or village, are made to provide food. Where this is physically impossible, food is issued from Military Government stores on a minimum scale of 2000 calories a day.

Accommodation.—Blocks of accommodation are made available by evacuating Germans and by making them double up in what is left. If this is impossible tents are provided.

Blankets.—Civil Affairs supply some, the Germans supply more. *The Germans also supply straw on which* DPs in transit can sleep. Whenever possible, bed-frames with straw covered with sacking are provided.

Cooking.—Sometimes the cooking arrangements have to be improvised, but some mobile kitchens are available. German baths are removed from their owners' houses and used as boilers, and kitchens of institutions are taken over.

Eating utensils.—The Germans are made to provide these. Failing this they are improvised.

Medical assistance.—A medical officer is attached to each Military Government detachment; some Red Cross teams are available; and there are doctors among the DPs themselves. The resources of local German hospitals for civilians are employed when necessary.

Language difficulties are solved by use of liaison officers and by use of polyglot DPs themselves. Many have learned some German.

REPATRIATION

The million west-bound DPs in the British zone are very anxious to return to their own countries, and many thousands of them have been evacuated already. The only limiting factor is the provision of transport to get them back. In many cases during military operations lorries going forward to the troops with supplies of food and petrol and ammunition were loaded with DPs for their return journey.

The formalities were a medical inspection to guard against the spread of infectious disease, a security examination to prevent the enemy escaping disguised as a DP, and special precautions against typhus—routine dusting with DDT powder. As he is evacuated each DP has *a card bearing his name, nationality, and* particulars of his examination; and he is not allowed to cross the Rhine unless these formalities are complete. Over the Rhine there were Army railhead transit camps established as soon as the DP organisation got working, and with the carrying of the railway further forward into German territory DPs will be collected at other points in the British zone. At the end of April the maximum rail lift was 4000 DPs a day. It has now been increased.

In Holland, Belgium, and France national reception centres have been set up, and here again the DP has to undergo a complete medical examination and a security examination, and to be provided with identity documents. The complete evacuation of DPs is expected to occupy more than six months.

The return of Russians, Poles, Czechs, Yugoslavs, and other east-bound nationals presents a different problem. Arrangements for these DPs in the British zone are made in camps in which they can live in reasonable comfort for whatever period may be necessary—certainly it will be months. Corresponding arrangements are being made by the Russians for collecting the west-bound nationals—chiefly French, Belgian, and Dutch—who will be found in their zone. It is expected that large areas in the British zone adjacent to the boundary with the Russians will be set aside for reception camps for east-bound nationals; and that similar collection camps will be established by the Russians near to the same point for the west-bound. Evacuation of west-bound displaced persons to France, Belgium, and Holland will probably be by train, but air lift may be called in. Evacuation of east-bound DPs may very probably be by air lift on a big scale because of the great distance involved.

VISITS TO DP CAMPS

The transit camp I visited near to the German border not far from Venlo was a typical example of a DP camp in action. The OC, a British major, had at his disposal a detachment of 8 other ranks and 2 non-commissioned officers, 2 police, 2 administrative officers, 2 medical *officers (Allied civilian), 2 other ranks from a* field-hygiene section, and a civilian staff of Russian DP volunteers who were doing the cooking and all camp orderly work. He was enthusiastic about their good work, order, and cleanliness.

The small town in which the transit camp was established was a good deal knocked about, but a large proportion of the buildings were standing. One building with a large hall in it, probably a school, was used as a centre for meals as it had a good, or goodish, kitchen with large boilers, &c., all of which were in charge of the *Russians.* The Dutch DPs had three buildings in the town for their accommodation, and there was a 40-tent camp to relieve congestion. A small hotel had been taken over to house DPs who were there as families. The percentage of families I was told had fallen, and was now under 10%. The entrance to this hotel was by way of a much bomb-damaged entrance to a large hall.

like room used for meals and for lounging about. At the entrance to this place stood a queer piece of furniture up-ended, from the back of which proceeded eerie and ethereal sounds of the plucked strings of a harp. Investigation cleared up the mystery by discovering a small Dutch boy, behind a damaged piano with its back wrenched off, plucking at the strings. The place was grimy, damaged, and untidy, but its hotel rooms provided furniture and (above all) privacy for the families of DPs temporarily housed there.

I was informed that there were about 2000 French in and out of this camp daily, and over 500 Dutch had arrived on the day of my visit. There were also some 100 Italians scooped up somewhere by the Germans, and the Russian volunteer staff were a little pocket (and a very welcome pocket) who just "happened along."

Attached to the camp was a British Red Cross hospital of 50 beds, and there were 35 beds in a German civil hospital. Some DPs who had come out of a concentration camp had to be kept in hospital. As far as medical supplies were concerned the camp was living off German stuff, of which there had so far been a sufficiency. White bread from Army supplies was available for the hospitals, and also chocolate and dried milk. The "hard ration scale" for May 1 was biscuits 6 oz., tinned meat 3 oz., tinned milk 2 oz. The food issue for the train journeys when DPs were evacuated was biscuits, 15 lb. box, and meat 6 lb. tin. Other food required was obtained by requisition on the burgomaster. Potatoes, vegetables, and meat supplies were coming in well. The mainstay of the diet was a meat stew. The Germans here, and at other places in Westphalia where I made inquiry, produced the food punctually and at once. There did not appear to be any shortage, and the appearance of adult Germans was that of well-nourished people. The high standard of the nutrition of the children was even more striking: red-cheeked, smooth-limbed, bright-eyed, and very active were those I saw in every place I passed through in a two days' motor drive. I heard of only one burgomaster who made any difficulty about furnishing food on requisition. He was informed that if he did not comply with the order he would be charged before the military court in the next town. This intimation was enough.

To return to the description of the transit camp. There were three large groups of tents for French nationals. A factory had been taken over to accommodate families with children on its first floor and medical examinations on the ground floor. A recreation room was in process of being created and the top floor of the factory was an overflow dormitory for men. There were other buildings in the town, and more tents; but with everything there was not enough to deal with any sudden influx. And the sudden influx might come at any time. The hours of work were all the hours there are, and for the three nights before my visit the staff had not got to bed until 3.30 A.M.

The day of my visit was a very crowded day. A large number of DPs had come in and the emergency accommodation had to be used. This accommodation was simple rather than primitive; for the remains of a beautiful old church, with practically no roof and almost all its glass windows out, is not primitive—perhaps stark is the word for it. On the floor of this church was spread straw, a blanket or so here and there, and amid the litter of some old carved pews still remaining and chipped stone columns supporting roof-beams, a few DPs squatted or lay or talked as they felt inclined. An adjoining chapel, also ruined, was also in use. In the paved churchyard outside the church doors was a collection of DPs of many nationalities. Three of them had built up little fireplaces from rubble and had lit fires with splintered wood, and two of them were boiling One bucket was filled with eggs—I estimated and another was boiling chicken.

This emergency accommodation certainly produced th impression of picturesque brigandage, and was in realit part of the wholesale picnicking of a horde of slave marching out to liberation.

All the DPs were examined, medically inspected and dusted with DDT and had their papers with them The DP index card headed "Allied Expeditionar Force" has on it the registration number of the DP, hi family name and other given name, and his signature This is form DP1. The AEF assembly centre registration card has more particulars on it, including claimed nationality and precise destination.

The medical officers exercising general hygiene supervision over the area and general medical administrative control belonged to a hygiene section of the British Liberation Army. They were assured that no epidemic conditions existed and that any possibility of typhus infection spreading was controlled by the medical examinations and by the dusting with DDT.

Another centre I visited was controlled by a lieutenant of an English county regiment who had been sent to the place in an emergency with orders to "get on with it." He was doing remarkably well and had acquired an UNRRA unit, some British Army personnel, and an ample food-supply for his DPs from the burgomaster. In this case buildings and accommodation generally were easier because there had been less shelling.

Another place visited was a semi-permanent camp for Russian DPs; this was a tented camp in beautiful wooded country. I arrived there on May 1, and the Russians—men, women, and children, looking fit—had cut down small firs to make avenues in their camp as a decoration for the festival of May Day. In this camp a large proportion of the beds were wooden frames laid on the ground and filled with straw. The tents were comfortable, the arrangements for food satisfactory, and sanitation good. The whole camp was under the control of a Russian officer who had been a DP. The inhabitants of the camp had two requests—to get back to Russia as soon as possible, and to have Russian newspapers and books sent them. There was no official interpreter, but I found a Russian girl DP who had learned German during her captivity and through whom I could talk to the others. Apart from the desire to get back home to Russia quickly, the whole camp had a happy air.

CONCLUSION

The problem of the displaced person and his disposal has been solved only by good planning to begin with and excellent improvisation on top of the good planning. The vast operation of moving millions of DPs from one part of Europe to another has proved more manageable than was thought possible. As regards disease, there does not seem to be anything to fear as far as our knowledge goes at present. When the time comes to sum up the results of this emergency operation of Military Government in Germany, it is likely that the verdict will be that all was and is well under control.

DISABLED PERSONS EMPLOYMENT CORPORATION LTD.—The Minister of Labour and National Service has appointed the following to be directors of this corporation, set up under the Disabled Persons (Employment) Act 1944: Viscount Portal (chairman), Brigadier A. C. Baylay, Sir Brunel Cohen; Mr. Samuel Courtauld, Miss Caroline Haslett, Mr. G. A. Isaacs, MP, Lieut.-General Sir Ronald Weeks, Mr. Frank Wolstencroft, and Mr. S. H. G. Hughes (financial director). The corporation will make provision for severely disabled people who are unlikely to get employment on their own account. It will join forces with voluntary organisations and local authorities which are already helping them, but it will also be able to establish special workshops with hostel accommodation and provide facilities for home workers.

In England Now

A Running Commentary by Peripatetic Correspondents

THE members of the Boys' Club are very interested in the BBC series "To start you talking." The local discussions which followed improved rapidly in the first few weeks. At first they were flippant, and speakers relied on cheap cracks at each other. To correct this we started giving five-minute talks on clear thinking, and logical argument (or at least, a bona-fide attempt at it) became a point of honour. One of their greatest faults was the boys' tendency to use for their premises not accepted facts but their seniors' opinions. Now, however, they challenge unsupported statements with admirable promptitude. With a few exceptions they argue without prejudice, more concerned to establish principles than to impress opinions. The older they are the more they are prejudiced, and it is rather pathetic to see a member trying to put over the Party Line unobtrusively. They talk with more sincerity and a far *greater attempt to be constructive than many of their* elders, but they have a set of principles which seem fundamental. Coming from a poor district, they are more concerned with a fair deal for everybody than with personal liberty. This is understandable, because they feel that they have never experienced this liberty—the control which stifles them is not bureaucratic but economic and social. They feel they have a chance of influencing the local authority, but none of influencing the local private enterprise. They do not put it like this, of course. They do not yet associate their fundamental wishes about these matters with the policies of the various parties (they support the Labour party as one supported Oxford in the Boat Race when at school, because it was "done").

There are, naturally, exceptions to this. We have a sombre Communist and a suave Conservative. The former says "Well, look at Russia" in answer to almost any question, and the latter confines himself to generalities. Unfortunately, the Communist is popular and the Conservative is not, so it is difficult to decide how much of the sympathy or hostility to their statements is generated by their personalities. There is another boy who says nothing except, once in every discussion, "It's all very well talking about housing" (or elections, or prison reform, or standard English, as the case may be) "but who's going to pay for it all?" It would not be difficult to guess which paper his father reads. Although the BBC has rigorously (and successfully) avoided political controversy as such,
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reform depends on social
nter-
ested in accents and dialec
with
life and think it is unfair
Philosophical discussions can wait.

The boys want information on current topics. They even asked me, spontaneously, for a talk on the proposed *national health service.* At *the same time they are* very conscious of the fact that they have left school, and resent being taught; most of the BBC's "guest experts" make them restless. Is it so difficult to give information to Youth without talking down to it?

* * *

As a medical registrar one has to find suitable cases for examinations—a thankless task at any time, but enough to turn one's hair grey during bombing epidemics. I remember about a year ago, with another Conjoint medicine looming ahead, racking my brain to think of a really suitable case. As you know, Conjoint cases have to be so "classical" that murmurs can be heard across the room, as well as felt, and stethoscopes are quite optional. Suddenly I remembered a vision seen in outpatients, with a localised rumbling apical diastolic murmur that hit the ear—a real sport of Nature just waiting for these glorious Technicolor medical films we are promised, for she was 23 and an artist's model. I pictured the old faithful, unable to diagnose her condition, thanking the examiner for showing him
' to go to
till I read
Feb 17:

"For my fifth shot at Medicine I was determined to leave nothing to chance. My examiner left me alone with an attractive young woman in the corner who gave her age as 23 and her occupation as artist's model—an advance on the usual hoary old tabetic, anyway. She was an excellent conversationalist. We chatted about the weather for a little, and the number of times both of us had been up for this particular examination. Was I a Cambridge graduate, by any chance . . . we talked about the Backs in the autumn . . . we discussed the perfection of King's chapel . . the punts lethargically slipping along the river at its foot. 'Did you ever hear them sing Madrigals under King's Bridge?' I found myself asking her, as the bell snatched me back to the sordidness of life. 'I'm afraid I shall have to examine you,' I apologised. 'I'm a heart case,' she explained, undoing her bedjacket 'you needn't bother to look at anything else.' 'I don't suppose I shall be able to hear anything' I told her sadly, 'I never can.' Nor could I. I was already resigning myself to another three months in the non wage-earning class when she whispered 'Did you hear my low rumbling diastolic? You can only bring out my presystolic by turning me on my left side or on exercise—I've never had rheumatic fever, but I had growing pains as a child. . . .' I would have sent her some flowers, but she wouldn't give me her *address.* '*They often ask,*' she *told* me sweetly, 'but I never give it away. You don't need it in the history, anyway.'"

This was vicarious pleasure indeed—it was increased when the examiner asked me whether I had seen the article, and when I asked him whether he had spotted her loquaciousness, his reply was "Oh yes, as a matter of fact I generally use her as a short case myself." Surely nobody can complain of our examination system when such innocent pleasure is had by the patient, the candidate, the examiner, and even the poor registrar.

* * *

How shall we know the green-brown birds by note,
that sing in copses, banks, and rustling sedge?
Know first the Willow Wren—no English scene
without his liquid cadence is full fair,
Spring's minute bell, high Summer's echoing grace.
Know too the Chiffchaff, he who calls himself;
the Blackcap's sudden burst of bubbling notes
like a boy's laughter, golden, unreserved.
The Garden Warbler always seems to me
to argue as though in some floral court,
his full toned voice seems pleading as in love;
the Whitethroat's hurried song, oft on the wing;
the Lesser's noisy rattle, preluded
by
th
m
the Warbler of the Reeds who does not know
whether to scold or chant a tuneful song
and mixes l
liked
to anglers'
and calls hi
, e Sedge
who learnt his chatter from the grating reeds
and gurgling river. Then above them all
the Maestro of the Copse, the Nightingale,
whom cockney bards like Milton, Keats and such
make feminine. O Master, what a slur!
Thy virile notes have such distinctive charm
that if you *think* you've heard them, then you've not.
These are the vagrant singers in our land
and God be thanked for gold.

* * *

The CO and I had gone down in the jeep for a late bathe in the river. The air was very still and hot. As we went, the clear blue sky darkened over with huge black clouds, and long jagged streaks of lightning flashed across from one dark mass to another. Away up the river, what at first appeared to be a low cloud could be seen, dark against the white pagoda on the nearby hill, and then we realised that it was moving quickly towards us and that it was not a cloud at all but a solid bank of dust. We sat in our bathing costumes on the hot sand and watched. There was a dead silence all around. Even the birds had stopped their twittering.

A hot wind blew up, *stifling* and dry, and the river was lashed into miniature waves, which broke whisperingly against the bank. Then came the dust, driven hard by the rising gale, blanketing all vision and stinging our unprotected bodies like needles. Broken branches of trees hurtled past and an occasional empty carton whisked by, spinning as it went. Loud cracks and the heavy crashing which followed told us that some of the palms were blowing down. We ran up to our necks in the water and covered our exposed heads with our towels. For ten minutes it blew, hotly suffocating, then the dust thinned out and big splashes of rain began to fall. Bigger and faster they came until it was a deluge, and the spray from the splashes was whipped violently away by the wind and blown down the river like a mist. Another ten minutes and like a tap turned off the deluge ceased, the sky cleared, and the sun once more blazed down. The air smelt invigorating and clean, and the dusty bushes and drooping palms looked fresh and alive and intensely green again. The birds returned to their incessant twittering in the trees and the storm over Burma was over.

* * *

Not even our best friends could describe us as high-class; nevertheless, and in spite of ourselves, we are being steadily forced up the social ladder by the gardener. When he told us that he intended to put in seakale this year we were all for it, for like most sensible persons we are partial to a bit of seakale just as we don't turn up our noses at asparagus or spinach or even strawberries. But our personal likes and dislikes had nothing to do with the gardener's reason for planting seakale. "I don't like to see a gentleman's garden wi'out seakale growin' in it" was how and why we got it. By the same authority, we are disallowed radishes. "They'm a workin' class vegetable," he says firmly, and that closes the conversation. The fact that social distinctions extend to the vegetable kingdom is new to me, though I have once heard winkles, cockles, and muscles snobbishly referred to as "poor man's fish."

On Active Service

CASUALTIES

DIED

Squadron-Leader **John Norman Williams**, MRCS, RAFVR

WOUNDED

Captain **W. F. Caldwell**, MB GLASG., RAMC
Captain **Gordon Houseman**, MRCS, RAMC
Lieut.-Colonel **G. E. Ord**, MB ABERD., RAMC
Captain **W. H McN. Wilson**, MB GLASG., RAMC

AWARDS

MENTIONED IN DESPATCHES

Brigadiers—
H. L. Garson
R. H. Lucas
Colonel—
B. J. Daunt
Lieut.-Colonels—
K. H. Clark
M. de Lacy
A. W. Gardner
J. A. D. Johnston
H. B. Lee
W. R. Logan
H. Sissons
Majors—
I. Aubrey
A. W. Box
D. A. G. Brown
T. J. Brownlee
J. A. Elliot
E. E. Evans
M. C. Fulton
I. C. Gilliland
J. M. Henderson
S. T. Henderson
J. Kerr
J. M. Leggate
W. R. McRae
W. Michie
R. O. G. Norman
I. D. Paterson
G. F. Petty
S. F. Raistrick
N. L. Russell
L. B. Wevill
E. G. Wilbraham
Captains—
I. H. Baum
C. J. Champ
J. Clark
F. W. Dickson
J. P. Gannon
H. L. Gardner
T. Gass
E. G. Hardy
G. F. Houston
R. T. Kiddie
K. Misch
A. B. Robertson
T. H. Sansome
G. D. Scarrow
A. Young
Lieutenants—
R. A. Condie
E. J. Rogers

MEMOIR

Squadron-Leader J. N. Williams, who was born in 1915, studied medicine at Guy's Hospital and qualified in 1939. After holding house-appointments at Belgrave Hospital, the Seamen's Hospital, Greenwich, and King George's Sanatorium, Liphook, he was appointed to a commission as flying-officer in the medical branch of the Royal Air Force Volunteer Reserve in 1941. He died on May 10 of injuries received in an t while serving as medical officer at an airfield wing arters in NW Europe.

Letters to the Editor

TRANSFUSION SERVICE

Sir,—Through the generosity of blood donors du the war, ample supplies of whole blood and plasma h been available for the treatment of civilian patient hospitals, with the result that the staff has grown ac tomed to unstinted supplies. During the past two ye we have used at this hospital approximately 1000 pi of blood and 1000 pints of plasma annually; t works out at 2·5 pints of each per occupied bed. involvi the bleeding of approximately 4000 donors per annu And the amount steadily increases.

Whilst it is possible that a substitute for plasma ma be forthcoming, it is difficult to imagine a future whe whole blood would not be required. Blood-transfusio is one of the most valuable therapeutic measures available, but (like other treatment) it costs money and mus be paid for. Questions to which I would like an answer are these:

(1) Can an adequate supply of blood donors be obtained without payment and/or pressure on relatives and friends of patients to supply blood?

(2) How far should the personnel employed in bleeding, grouping, and administration of the service be on a voluntary basis?

(3) Are we to continue to enjoy the valuable aid of the Ministry of Health in the processing of plasma and the supply of apparatus? Can we rely in the future on the help of special laboratories, such as the Galton Laboratory at Cambridge, to help in elucidating grouping problems?

These are questions which must be in the minds of many transfusion officers, and now with peace in Europe demand an early and satisfactory answer.

E. Biddle,
Transfusion Officer, East Suffolk and Ipswich Hospital.

THE MEDICAL SUPERINTENDENT

Sir,—Sir Frederick Menzies does well to point out the difference between special and general municipal hospitals, for herein lies the crux of the problem of administration. The special hospital employs as a rule only one team, firm, or unit of doctors, the senior member of which is not only the head of the hospital but also the chief administrator. In practice he delegates much of the day-to-day administration to a lay secretary.

But nowadays quite a different state of affairs exists in the more enlightened municipal general hospitals. In these there are now full-time or part-time specialists in charge of the different departments, who are of equal status; and the medical superintendent, who until a few years ago was the only "specialist" in the hospital (apart from occasional visits from odd visiting ones), is now one of many. Should he under these altered conditions continue to exercise autocratic powers? Should he continue to be the "boss" or "captain" of the hospital? Or should these powers be surrendered to a committee of the responsible specialists?

On this point the recommendations of the Goodenough report on medical schools (p. 67, paras. 19–21) are clear and concise.

Leicester. T. M. J. d'Offay.

PSYCHOSOMATIC MEDICINE AND THE BIRTH-RATE

Sir,—I should like to express my appreciation of the article by Dr. J. L. Halliday in your issue of May 12. The fact, and the widespread incidence, of social disintegration need emphasis, especially in these days of wishful thinking; though, to be sure, the history so far of the present century is sufficient proof for all with eyes to see. I particularly agree with Dr. Halliday's tracing of the pathology of the condition to the loss of the individual person's sense of belonging to some society greater than himself, with consequent isolation, insecurity and anxiety, frustration, and resentment.

But are Dr. Halliday's remedies, as far as he has stated them, sufficient? Doctors are notoriously chary of venturing outside the scope of their science and art into wider philosophical issues; but inasmuch as health truly means wholeness, and that of the personality in all its aspects, in this particular matter they can hardly avoid doing so. The failure of a purely secular solution to this roblem of membership of an organic society has been emonstrated by the conception, growth, and downfall f National Socialism in Germany. Communism shows

e satisfactory.

cure for man's

f a church, and

tive membership of a better sort of church would n to be the right answer, as Dr. Halliday would prob- agree. Can any other Foundation be laid, than is already ?

JOSEPH V. WALKER,
Medical Officer of Health.

amsgate.

THE NURSING SYLLABUS

SIR,—I think many must have read with some con- lerable apprehension the revised syllabuses for both he preliminary and final State examinations, especially ince on the front page appears the statement "As pproved by the General Nursing Council for England nd Wales." I can hardly believe that they are pproved by either the medical and nursing profes- ions or the hospitals who will have to administer them.

In my opinion, many of the subjects have nothing hatever to do with the training of a practical nurse. or instance, on p. 7 of the subjects for the final State xamination appears a paragraph : "Structural defects f houses unfavourable to good domestic management." t would be interesting to know exactly what this means.

In both syllabuses appears the word "lighting," ut nowhere has any provision been made for some nstruction in electricity. Although there are many nd varied electrical appliances used in hospitals, few, f any, student nurses know the difference between lternating and direct current, why an earth is necessary, r the meaning of voltage. Nor, as a rule, is any in- truction given in the proper use of electrical heating ads, surgical diathermy machines, electric cradles, c. Surely some simple instruction could be given n these matters, and on the simple precautions which nust be taken when using electrical appliances. Un- ortunately, there have of late been several accidents n hospitals, caused entirely by this lack of knowledge.

I feel that the time has now come when a firm stand hould be ma in which he General nursing rofession an the press here are paragraphs complaining of the shortage of urses, but instead of making matters easier, the General Nursing Council seem intent on making it more difficult or a girl to train as a nurse.

Royal Hospital, Richmond, Surrey. AUCKLAND.

GENERAL PRACTICE A SPECIALTY?

SIR,—Whilst I find myself in general agreement with the views of Mr. Douglas Robb, and particularly with his statements that the attempt to combine general practice with a [different] specialty results in both fields suffering, I should like to comment briefly on two points from his article quoted in your annotation of May 19.

First as to scientific method. The good general practitioner must be an artist, but he must also be a scientist : the scientific method is just as necessary in the extraction, evaluation, and comparison of his patients' histories as it is in any laboratory procedure. Where the mistake lies is not, I submit, in trying to work "under the discipline of modern science" but in trying to learn and use the techniques of other specialties.

The second point is the question of "dull" work. Now, Sir, work is dull when it does not make us stop and think : this may occasionally be due to the fact that there is nothing to think about, but nearly always to one of two causes—either, as in the case of the over- worked and underpaid panel doctor, to sheer lack of time, or, in the case of most of us, to inadequate and unsuitable training which fails to make us realise the need to think. How many of us could say that we have completely solved all the problems which any one patient's illness presents to us ?

The inauguration of the new National Health Services provides a unique opportunity for raising the status of the general practitioner : an intelligent community, which believed that prevention was better than cure, would seek to have its best doctors go into general practice. The question is, are we an intelligent community ?

London, SW18. F. GRAY.

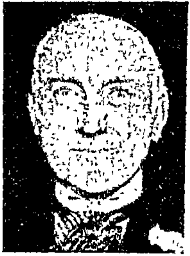
Obituary

STANLEY WOODWARK

KT, CMG, CBE, M.D LOND., F R C P, J P. D L

Sir Stanley Woodwark was not a great physician in the academic sense, but he was certainly an outstanding member of the profession, notable in any medical assembly. In some ways his mental gifts were the coun- terpart of his physical attributes ; and with a clear appreciation of his natural advantages he rose to success in his undertakings.

"I first saw him," writes A. A., "in 1911 when as curator of the museum at St. Bartholomew's and medical tutor at King's College, he was closely in touch with the students, by whom he was recognised as an exceptional and highly successful coach. I recall his addressing a large audience of the Abernethian Society on the subject of general practice and the impression—one might say the sensation—he created by his fluency, his elocution, his sense of the dramatic, and his ability in the subsequent discussion to speak extempore. I had written an editorial article in the hospital journal upon Clinical Education, and sub- mitted it to him for an opinion, with a lively expectation of approval. 'It's mud,' he said, as he handed it back, adding as an afterthought, 'No. There's some sort of substance in mud : it's just ditchwater.' That was hardly a propitious start of a friendship and professional association which was to con-



Press Portrait Bureau

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Generous in appreciation when he approved, he found it difficult to refrain from indulging his love of logical exposition and his ability for pungent criticism. There is reason to suppose that he prejudiced his early career by his outspokenness, by alienating those in authority. And although to some extent this propensity persisted throughout his life, he mellowed considerably and few men can have had a wider circle of friends and no man a wider circle of acquaintances. He had been a diligent student who passed his examinations with ease, and with a certain degree of distinction (honours in MB, BS Lond. and subsequently MD) but he was conspicuous more for character and capability than cleverness. He did not take a house appointment at his own hospital but filled several resident posts at the Royal Free. After some experience of general practice he decided to embark upon a career as consultant ; and although disappointed of election to the staff of a teaching hospital he was fully occupied in practice and with a great deal of tuition when war broke out in 1914.

"Almost remarkably his organising and administra- tive ability became speedily recognised at the War Office. In a short time he was engaged in multiple official duties as deputy assistant director-general, deputy assistant director of medical services for London, and consulting physician to Queen Alexandra's Military Hospital, and he early reached the rank of colonel. After the Armistice he was chiefly concerned with demobilisation of the

to the staff of Westminster Hospital gave him consider- able satisfaction, especially as the simultaneous office of dean to the medical school provided an outlet for his organising enthusiasm. At the time of his election the clinical school had fallen to the lowest possible number

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he wrote a *Manual of Medicine*, but this was designed more with a view to examination requirements than as a serious contribution to medicine. Subsequently he wrote very little, and clinical meetings made no appeal to him; but he found his chief interest in insurance work, and as a medical witness in compensation cases. In these his approach was distinctly forensic. He would have been a first class advocate and indeed his natural propensity in this direction manifested itself in his approach to all discussions, and even in intimate conversation. At committee meetings he welcomed a polemical atmosphere, though he was careful subsequently to relax and explain that the heat of debate bore no relation to his personal regard for those with whom he had disputed.

"He was essentially an extrovert. Shortly after qualification, he took a long voyage as ship's surgeon, and he frequently referred to the misery he had endured through lack of congenial conversation. Solitude was torture to him. He had, he said, on occasion taken a tram ride merely to have fellow mortals in proximity. It is not surprising that such clubs as the Savage, the Knights of the Round Table, and the City Livery welcomed him as an agreeable and congenial spirit. And among his many admiring friends of the Savage, George Belcher, George Stampa, and other artists found him an ideal subject for illustrations in *Punch*. His temperament and his ability also explain his devotion to the City companies. He became master of the Society of Apothecaries, of the Worshipful Company of Barber Surgeons, and of the Worshipful Company of Turners. He was president of the Royal Institute of Public Health and Hygiene; he was on the council of such varied interests as the British Health Resorts Association, the Medicolegal Society, and the Medical Defence Union, and a number of others. And while with a strict sense of duty he was a regular attendant at all committees, there is no doubt that formality of procedure gave him a real pleasure.

"Although the most delicate of all, he was the last survivor of a coterie of distinguished Bart's men in the early years of the century that included R. B. Etherington Smith, H. E. G. Boyle, and Harold Pritchard. Never a strong man and completely lacking in outdoor interests, he was often in indifferent health, yet contrived to preserve an unremitting application to his numerous obligations until a coronary thrombosis compelled a long rest in his 60th year. Thenceforth he fought courageously, defying prognosis by manifesting unexpected resources for recovery, but during the last twelve months his friends and advisers were saddened by the spectacle of his pathetic struggle against the inevitable. Time after time he rose from a sick-bed to take the chair on special occasions; one by one he abandoned regretfully but resignedly his various official positions. Even to the end he clung to the activities that meant everything to his enjoyment of life, and only a few minutes before his death, which came with merciful swiftness, he was discussing with his most intimate friend the prospect of resumption in the near future."

Sir Stanley Woodwark died in London on May 11, aged 70. At the memorial service at St. Margaret's, Westminster, on the 16th, a large and representative gathering paid tribute to the multiplicity of his interests and activities; to the contacts he had established; and to the friendships he had cultivated and sustained.

SAMUEL INGLEBY ODDIE

M B EDIN.

Mr. Ingleby Oddie, perhaps the best known of all coroners, died on May 8 at his home at Croxley Green, Hertfordshire, at the age of 76. He had had a full and varied life, and had thoroughly enjoyed it. At sixteen he left school to be "crammed" for the Indian Civil Service, but the examiners' insistence on higher mathematics revolted him and he turned to medicine. In 1891, when still only twenty-one, he graduated MB at Edinburgh University. Passing first in the severe examination for a medical commission in the Royal Navy, he spent several years in that service, before joining a general practice at Malden in Surrey. But in the midst of this work Oddie found time to read for the Bar. He passed his examinations with ease and distinction, and was called by the Middle Temple in 1901.

The work of a London coroner attracted him, and he trained in Dr. Danforth Thomas's court while he carried on a mixed law practice at the Old Bailey, the courts of the South-eastern Circuit, and the North London sessions. In his new profession his medical background stood him in good stead, and he was already deputising for a London coroner when he appeared as Sir Richard Muir's junior against Crippen and later against Steinie Morrison, the Clapham Common murderer. In 1912, he was appointed coroner for Westminster and South-west London in place of Dr. Henry Troutbeck. He was the last coroner for the city and liberty of Westminster to be appointed by the dean and chapter of the Abbey, before this 800-year-old office was transferred to the LCC in 1926.

Press Portrait Bureau

During his 27 years of office Oddie held nearly 30,000 inquests on bodies found between the Temple and Putney, between Oxford Street and Clapham Common.

His practical experience in the law-courts proved of value to him in handling cases and witnesses in the coroner's court. But he always maintained that he found his medical knowledge of far greater use than his legal qualifications, and he held that every coroner should have a medical qualification. He was noted for his punctuality, his rapid conduct of cases, his sympathetic attitude towards witnesses, his concentration upon the real object of his inquiry, and his impatience with irrelevance. In the inquest on the Charing Cross railway accident, in which six people lost their lives, he aroused the admiration of the electrical engineers and other technical experts by his quick and precise comprehension of the intricacies of their craft. He was equally efficient in probing the many cases of murder that came before him, for these mysteries always excited his keenest enthusiasm and called out his greatest ability, and his fascinating autobiography, *Inquest*, published in 1941, is full of famous and infamous names: Brinkley who murdered the old German widow Blume for her money, and three other people by accident; the young actress Billie Carleton, whose death revealed the alarming prevalence of drug addiction in London in 1918; Sir Henry Wilson who was murdered by Irish political assassins; and Mrs. Bonati, whose remains were discovered in a trunk at Charing Cross station.

Oddie retired in 1939, and he found his last few years pleasant despite the war, sitting in his country garden, strolling in the woods and fields, and reading; for books delighted him through the whole of his life.

SOCIALIST MEDICAL ASSOCIATION.—On Saturday, June 2, at 3 P.M., at the London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1, Prof. J. A. Ryle will speak on health problems of British India. Prof. J. M. Mackintosh will preside. Admission 1s.

Medicine and the Law

Convicted Doctor and Contempt of Court

Dr. Delbert-Evans, who was sentenced to five years' penal servitude at the Old Bailey last October for conspiring to perform illegal operations, gives his name to what will be a leading case in the law of contempt of court. He made an unsuccessful appeal to the Court of Criminal Appeal; but meanwhile the *News of the World* published an article on the Old Bailey trial. The article was headed "Doctor Unmasked—Scotland Yard were after him for Twenty Years"; it referred to a "missing fortune" which it suggested the doctor had accumulated. These references were not justified by any evidence given at the trial. If this publication had appeared when the trial was still pending, it would have been a contempt of court inasmuch as it tended to interfere with the chance of a fair hearing; it might well influence the mind of someone summoned to act as juryman. The question in the Delbert-Evans application to the King's Bench Division was whether it would be a contempt of court if the article were published after conviction and sentence (when the jurymen had given their verdict) but before an appeal had been heard by the Court of Criminal Appeal. Would there be any danger that the judges in the Court of Criminal Appeal would be influenced?

The answer is that the judges, though their task is to decide the criminal appeal upon the law and not the facts, are technically equipped with jurisdiction to [illegible] like jurors. [illegible] assume that [illegible] be affected [illegible] for a judge to hear of things which would make it more difficult for him to do his duty; jurors are not the only people who should be protected from the annoyance of having matters presented to them which would be quite inadmissible in evidence.

Looking at the facts of the Delbert-Evans case, the Divisional Court, though it thus declared the legal position, doubted whether the *News of the World* publication contained anything which amounted to contempt of court. Judges do not lightly interfere with the press. No harm had been done to anybody. Dr. Delbert-Evans's application was therefore dismissed with costs.

The lesson of the case is that newspaper editors must reserve their comments on a criminal case till the last word has been said by the Court of Criminal Appeal. One wonders whether even that is the end. The convicted doctor goes to prison for five years; but the Home Secretary could conceivably shorten the sentence or advise a pardon. Is not a Home Secretary human too?

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

On Thursday Lords and Commons assembled in the Royal [illegible] Lords to present their loyal [illegible] on the end of the war to the [illegible] jesty deliver his speech in rep[illegible] remony was significant of the foundations of our constitutional practices.

We are moving swiftly now from war organisation to that of peace. Demobilisation starts soon, industries are turning over towards peace production, and there was an important debate on the resettlement of Service personnel and war workers. On the orderly unwinding of the great war machine we have built depends the smoothness of the transition period. Sir George Schuster, who opened the debate, was sceptical of the practical value of some of the abstract theories as regards full employment. But he thought our main jobs for the next few years were plain. He put housing as the A1 priority, and second the lay-out and equipment of basic industries coal, iron and steel, textiles, transport. Third in priority comes exports of the right kind to buy our imports, and fourth the necessary consumption goods to carry on our lives. These priorities demand a planned agricultural production.

Mr. Bevin, Minister of Labour, presented his problem to the House as "a two-stage ending of the same war." Demobilisation starts on June 18 and includes men from all theatres of war, including Burma. Between then and the end of August groups 1 to 11 will be demobilised. Mr. Bevin wants to leave as few ex-soldiers as possible as general labourers and to have as many as possible trained for other kinds of work. His schemes provide for every class of ex-Servicemen and cover a wide range of occupations. He thinks we shall have national service of some kind for a number of years and this will take one age-group out of the general labour market. The raising of the school age will take another, and there are at present in industry a million men over 65 and women over 60, while women with household responsibilities would probably leave industry in substantial numbers. For these reasons he expected that for some time there would be a labour shortage.

Mr. Bevin spoke of his anxiety about the nursing profession. He is to make every effort to persuade women coming out of the Forces to join it, and he is ready to give financial help to build up a strong nursing force.

From a question to Mr. Willink as to his meetings with the Medical Negotiating Committee nothing definite emerged. But the House certainly feels the urgency of a decision to implement the National Health Service white-paper, and hopes for a statement when the House reassembles.

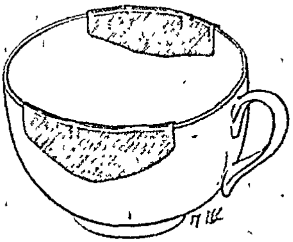
Notes and News

CHINA'S HEALTH PROBLEMS

The new edition of this handbook,[1] first produced in 1941, [illegible] date and [illegible] venereal [illegible] ficiencies. China, with its vast population, is largely overrun by enemy troops; communications are poor, and there are but 12,000 trained doctors instead of the quarter of a million that are needed. The death-rate is 25 per 1000 living, the maternal-mortality rate 15 per 1000 births, and the infant-mortality rate about 200 per 1000. Many of the excellent plans which have been formulated are bound to remain mere blueprints for many years to come, but it is encouraging to note how much emphasis is laid on the spread of health education the develop- [illegible] the United Aid to China Fund and of the British and American Red Cross organisations.

PROTECTION FROM CHIPPED DRINKING VESSELS

Mr. W. P. Alexander has invented a simple device for protecting the lips from abrasion and infection by chipped or cracked cups and glasses. It consists of a roughly oval disc of 'Cellophane' or similar plastic material, moulded to the shape of the rim of the cup or glass, which can be clipped on before drinking, as illustrated. The clips would be sterilised in manufacture and issued in air-tight cellophane bags. They can be made very cheaply, in a variety of sizes, and Mr. Alexander suggests that teashops, restaurants, canteens, and public houses should provide one with every drink ordered: Service men and women might also find them useful, at home or abroad. Manufacture is being arranged.



Cup with two clips in place. Only one will normally be used

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[1] China's Health Problems. [illegible] Szeming Sze, MB Camb., general secretary, Chinese Medical Association, PO Box [illegible], Washington, DC, USA. Pp. 76. $1.

A LARGER AMBULANCE

An improved ambulance, which will carry 12 instead of 4 stretcher-cases, has been developed by the United States Army. It has an aluminium body with a front-wheel drive which allows the floor to be placed lower, making it easier to move patients in and out. It rides more smoothly than the old type and includes such refinements as a heater for use in cold weather, ventilating fans, window shades to provide privacy in traffic, and individual electric lights over each stretcher. Both attendant and driver sit enclosed with the patients.

University of Glasgow

Dr. W. J. Hamilton, professor of anatomy in the University of London at St. Bartholomew's Hospital medical school, has been appointed to the regius chair of anatomy in the University of Glasgow.

Dr. Hamilton, who is 42, was educated at Queen's University, Belfast, where he took his BSc with first-class honours in 1926. Three years later he graduated in medicine, again obtaining first-class honours, and passing out first of his class. After holding house-appointments at the Royal Victoria Hospital, Belfast, he went to Glasgow as university demonstrator in anatomy and in 1932 became lecturer. The following year he was awarded the Struthers prize and gold medal in anatomy and obtained his DSc Glasg. in 1934. In 1935 he came to London as deputy director of anatomy at St. Thomas's Hospital medical school. The Royal Society of Edinburgh, to whose fellowship he was elected in 1936, awarded him the Neill prize in 1938 and he has published in their transactions memoirs on embryology and related subjects. He is also one of the authors of a *Text Book on Surface and Radiological Anatomy* (1938) and this year with J. D. Boyd and H. W. Mossman he has produced a textbook on *Human Embryology.*

Royal College of Surgeons of Edinburgh

At a meeting on May 18, with Prof. R. W. Johnstone, the president, in the chair, the following were admitted fellows:—

F. E. D. Hallon, H. A. Hashemian, Abdu [illegible] Laurence, M. R. Liddell, C. B. Limerick, J. W. [illegible] D. M. Sheppard, Betty V. Slesser, I. J. Thoma[illegible]

Extra Milk and Eggs for Repatriated Civilians

The Ministry of Food has arranged for repatriated civilians whose health has suffered from an inadequate diet to obtain extra milk and eggs. On production of a medical certificate at the food office, stating that he is suffering from malnutrition, the patient will be authorised to obtain 14 pints of milk and 3 shell eggs weekly for one month. The grant may if necessary be renewed for a further month on submission of a fresh medical certificate. Separate arrangements have been made for returned Service and Merchant Navy prisoners-of-war.

Award of Lister Medal

The Lister medal for 1945 has been awarded to Sir Howard Florey, FRS, for his work on penicillin and its application. He will deliver the memorial lecture later this year. This is the eighth award, which is made by a committee representative of the Royal Society, the Royal Colleges of Surgeons of England and Ireland, and the Universities of Edinburgh and Glasgow.

Royal Society of Medicine

At the section of odontology on Monday, May 28, at 4.30 PM, Mr. E. A. Hardy, LDS, will read a paper on epithelial inlays in the mandible, and Flight-Lieutenant H. Mandiwall on visual education in dentistry. At the meeting of the section of medicine on May 29, at 5 PM, films will be shown illustrating conditions in German concentration camps and there is to be an exhibition of photographs showing the physical condition of victims. Afterwards Dr. H. E. Magee, Dr. D. P. Cuthbertson, and Dr. Hugh Stannus will open a discussion on protein hydrolysate. On June 1 the section of epidemiology and state medicine will meet at the RAF Station, Halton, Bucks. At 3 PM, an address will be given by Sir Harold Whittingham, director-general of medical services, and afterwards Wing-Commander T. Macrae, D SC, and Squadron-Leader Smart will speak on nutrition in the RAF. The combined summer meeting of the sections of laryngology and otology will begin on the same day at 10.30 AM when Air Commodore E. D. D. Dickson will give a demonstration of RAF hearing-tests for use in the selection of flying personnel. At 2.30 PM, Wing-Commander G. H. Bateman will read a paper on sinus barotrauma, and Mr. Norman Patterson on [illegible]idal operation.

A Director of Research

Sir Jack Drummond, D SC, FRS, chief scientific adviser to the Ministry of Food, has been appointed to the post of director in charge of the scientific research of Boots Pure Drug Co. Ltd. He has resigned the chair of biochemistry at University College, London, which he has held since 1922, but he will not yet take up his new appointment.

A Town's Blood Donors

On VE-day [illegible] a total of 105 invited, attended a b[illegible] Bedfordshire, [illegible] the Ministry of Health and the Med[illegible] In relation to its size (pre-war popu[illegible] Buzzard is believed to have set up a record for blood donations for Service and civilian needs. Of a panel of 500–600 donors, 220 have each given ten or more donations, and 410 five or more. Over 5500 bottles of blood have been collected in the town since 1940 by mobile units from the NE London Blood Supply Depot, Luton.

Freeman of Paddington

On May 17 the freedom of Paddington was presented to Sir Alexander Fleming, FRS, "as a token of the high esteem in which he is held by the civic authority of the borough in which he carried out, at St. Mary's Hospital, his scientific researches, and in which his discovery of penicillin was made." Mr. Brendan Bracken, Minister of Information, who described Sir Alexander as a "back room boy of St. Mary's," said that the future of England depended on our scientists, doctors, teachers, and clergy, and made a plea for greater financial encouragement to the professional classes. Sir Almroth Wright, FRS, also paid tribute to Sir Alexander's work, and the new freeman after signing the roll expressed his hope that the borough council might help the hospital to obtain some more ground for its reconstruction.

Appointments

LUTWYCHE, VIOLET U., MB CAMB.: medical registrar Elizabeth Garrett Anderson Hospital, London.

ROSENTHAL, R., MD PRAGUE: RSO, Coventry and Warwickshire Hospital.

Births, Marriages, and Deaths

BIRTHS

COODE.—On May 15, at Newton Abbot, Devon, the wife of Surgeon Lieut.-Commander C. D. Coode, RN—a son.

DOUGLAS-WEBSTER.—On May 12, in London, the wife of Surgeon Lieut.-Commander E. M. Douglas-Webster, RNVR—a daughter.

DUNCAN.—On April 27, at Birmingham, the wife of Dr. Neil A. Duncan (CMS. St. Helena)—a son.

GARDHAM.—On May 15, in London, the wife of Mr. John Gardham, FRCS—a daughter.

GOODDY.—On May 12, in Edinburgh, to Dr. Edda Gooddy (née Deas) wife of Dr. William Gooddy, RAMC—a son.

LAWTON.—On April 27, at Murree, N. India, to Captain Ann Lawton, IMS, wife of Captain H. W. D. Lawton, RAMC—a daughter.

O'REILLY.—On May 15, the wife of Dr. E. O'Reilly, of Chacewater—a son.

PAYNE.—On May 14, in London, to Dr. Margaret Payne, wife of Captain Anthony Payne, RAMC—a son.

RICHARDSON.—On May 15, the wife of Lieut.-Colonel J. C. Richardson, RCAMC, of Sherborne St. John, Hants—a son.

MARRIAGES

DODS-BROWN—WRIGHT.—On May 9, in Belgium, John Lawson Dods-Brown, captain RAMC, to Elsie Mary Cecilia Wright, BRCS.

HARRISON—GOODING.—On April 30, at Oxford, Ronald G. Harrison, BM, to Marjorie Gooding.

STAMMERS—PEEL.—On May 8, at Cambridge, F. M. G. Stammers, surgeon-lieutenant RNVR, to Elizabeth Mary Peel.

DEATHS

STEEDS-BIRD.—On May 16, at Southsea, Elliott Beverley Steeds-Bird, DSO, LRCPI, FFR, lieut.-colonel RAMC, TA, retd., aged 64.

WHICHELLO.—On May 16, at Chester, Harold Whichello, MRCS, aged 75.

short supply owing

MEDICAL PROBLEMS OF SOUTH-EAST ASIA COMMAND *

H. L. MARRIOTT, MD LOND., FRCP
BRIGADIER; CONSULTING PHYSICIAN, ALLIED LAND FORCES, SOUTH-EAST ASIA COMMAND; FORMERLY CONSULTING PHYSICIAN, INDIA COMMAND; ASSISTANT PHYSICIAN, MIDDLESEX HOSPITAL

FOR the past three years I have been fortunate in occupying posts which have provided the opportunity for a perspective view of the medical problems of this theatre. During that time one has seen an enormous growth of the medical services. ALFSEA and India now have an establishment of 351 medical specialists; [illegible] n greater than [illegible] rganisation has [illegible] 1942 marked the phase of supreme difficulty—near chaos—of the retreat out of Burma, when our army and nearly a quarter of a million civilians poured back into Assam. Those were the days typified by a 500-bed jungle hospital having somehow to cope with 3000 patients with most of its own staff suffering from malaria. The medical services were [illegible] did not crack. From then o[illegible] up has continued and now we [illegible] serving a great and victorious army.

[illegible] from the experience of [illegible] e tremendous import- an[illegible] n-power. No figures of [illegible] n 1943 the admission-rat[illegible] units was just under 12[illegible] 44 it was just under 10[illegible] to every man in the for[illegible] the course of a year. Disease has played an enormously greater part in man-power wastage than has enemy action. The ratio of casualties from sickness to casualties from wounds in 1943 was 121 : 1, and in 1944, a year of heavy fighting, it was 10 : 1.

The effect of disease in wasting man-power is not to be measured merely by arithmetical calculation of man-days lost—gigantic as has been this total. There must also be reckoned the effects due to disruption of units and to influence on morale. In the Arakan campaign in 1943 some units were losing their entire personnel, with replacement by reinforcements, every six to eight weeks. Imagine the task of commanders trying to operate forces, in the face of the already fearful difficulties of climate, terrain, and supply, with all their officers, NCOs, and men constantly changing. The potentiality of a heavy incidence of disease will continue all the way to Tokyo. Our path will run through regions as unhealthy, and in some places more unhealthy, than any we have yet experienced.

[illegible]

east Asia if they will take a wide view of their function. This is not merely [illegible] referred to them. [illegible] physicians, is to as[illegible] act as teachers and [illegible] to train general duties officers, nurses, and nursing orderlies. Always *they must try to see the medical* war effort as a whole and to escape from a narrow, purely hospital outlook—natural legacy of civilian days. An army exists to fight, not go to hospital.

PREVENTION OF SICKNESS

In war in the tropics the hygiene branches of the medical services are the most important of all. Our hygienists have done a great job. We have only to look at the results accomplished by the anti-malaria units. It is a piece of good fortune that our Director of Medical Services is a hygienist by training.

The present allocation of personnel, as between the preventive and curative sides of the medical services, is still largely governed by a tradition and organisation based on the experience of temperate climes or the civilised cantonment. The relative ratio of hygiene personnel to the rest of the personnel in the Army Medical Service has been increasing. I hope this trend will continue with the utmost rapidity. At least four-fifths of our sickness casualties have been due to diseases capable of classification as "preventable." This being the case it would seem rational to employ a very much higher percentage of our personnel in the business of prevention. Any men given up to the hygiene side by the hospitals and other curative units do not represent loss to those units, because the diminished incidence of disease will result in much less work for them. One medical officer engaged in hygiene can save the work of ten medical officers in hospitals.

What has been said is not a criticism of our hygiene branch but a plea for its strengthening so that it may greatly increase the good results already achieved.

The extent to which disease can be prevented depends on the extent to which medical advice is actually followed by officers and men. This, in turn, depends on the degree of belief and acceptance in their minds. In this respect it has become obvious that with the modern soldier mere orders are not enough. He must be convinced of the vital importance and soundness of preventive measures advocated before he will really carry them out. And he needs constant reminding. The required technique of persuasion and reiteration is allied to salesmanship and advertising. These methods are beginning [illegible] effectively use[illegible] I would urge t[illegible] should have as one of its sections, perhaps its most important branch, a section of propaganda staffed by experts in all forms of publicity including film and radio.

RAPID CURE AND RETURN TO DUTY

After disease prevention, the most important function of the medical services is the rapid cure and return to duty of all sick and wounded. In this respect the value of diagnosis and treatment at the earliest possible moment cannot be overstated. The diseases with which we mainly deal—particularly malaria, diarrhœa, the dysenteries, and skin diseases—have in common that [illegible] is proportional to the speed [illegible] hat is done at once matters [illegible] be done several days later.

It is essential that our dispositions and organisation should be shaped with the paramount aim of effective early treatment kept always in view. The Indian malaria forward treatment units were a great step in the right direction. They have treated tens of thousands of men forward and returned them to their units in two or three weeks instead of in months as happens when men get into the great evacuation machine.

If good work is to be done forward, then good medical personnel must be forward. We must get more of our best physicians in front. There they will be more valuable than in the best base hospital.

Our job is to get men back into the line in the shortest possible time. We can only do this if we deal with the sick as soon as they become ill and cure them at once. We will not do it by waiting until their illnesses become really bad and then treating them, albeit in excellently *appointed hospitals, hundreds or thousands of miles* away. This is not an attack on the policy of evacuation, which of course is n[illegible] in this theatre has l[illegible] the air route. It is a[illegible] by the elimination of cases, at present a large number, who need not be sent back because they will be ill for only a few days if dealt with immediately.

THE REGIMENTAL MEDICAL OFFICER

Regimental medical officers, after hygienists, are the most important medical officers in the army. A really good RMO can do wonders for his unit in the way of organising preventive measures and by the immedia treatment of such as fall sick. He can make a difference of at least 1 per 1000 per day in the admission-rates taken over the year. Multiply this through only a division and it means the elimination of one 400-bed hospital.

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* Partly based on a paper given at a conference of the Medical Specialists of Allied Land Forces, SEA, in February 1945. For security reasons figures are stated in somewhat vague terms.

The good RMO must be a good doctor and have a good personality if he is to carry weight with his OC and the regiment. The bad doctor, or the man with a poor personality, is a misfit. Our attitude towards RMOs should be adjusted until we regard them as the pick of the bunch—a corps d'élite in fact. Though there are many good ones, we have a long way to go before this ideal is attained. We cannot avoid having some inferior medical officers but the hospitals should carry them, not the regiments. In a hospital there is the commanding officer, there are the officers in charge of medical and surgical divisions, and there are specialists, all of whom can supervise, guide, or coerce a bad general duties officer. In a regiment the RMO is on his own—for better or worse. Higher rank would be a great advantage. Our directorate has been trying to secure majorities for at least a proportion of RMOs.

Regimental medical officers must be good material in the first place, but steps must be taken to enhance their quality. Their enthusiasm must be maintained and their knowledge increased. There are various ways of doing this—an important one is to have periodic courses or conferences at which the importance of their rôle is stressed and very practical instruction given.

IMPORTANCE OF PATHOLOGY

Tropical medicine is founded on pathology, and good medicine cannot be done without the backing of good pathology. For a long time this theatre has been very short of pathologists and technicians. Those that have been here have worked splendidly. With the European war in its closing phases, there is now hope of strong reinforcements. In the past a laboratory has often had to be shared by two, or even three, hospitals. It is now our policy that all hospitals, including malaria forward treatment units, shall have their own laboratories and that each army corps shall have a mobile laboratory to serve the casualty clearing stations and field ambulances. A central laboratory for ALFSEA is planned and on the way. Its functions will be to exercise general direction and control, to do special work, to maintain training courses, and to establish a central reference library and museum.

The value of forward diagnosis and treatment has been stressed. For it to be achieved, good pathological facilities are essential. The corps laboratory is a step in the right direction. Another development, much to be desired, would be the provision of a good technician for each field ambulance and casualty clearing station.

MALARIA

Malaria has so far been our greatest problem. It has been the cause of nearly half of all our total sickness. In the transmission seasons its incidence has at times so risen that it has been responsible for more than 80% of all admissions. Our experience of malaria in the last three years is measured in hundreds of thousands of cases. Fortunately the battle against malaria is being won. The incidence is now but a fraction of what it was. The measures which have resulted in this victory —perhaps the real decisive battle of the war in south east Asia—cannot for security reasons be detailed in a journal circulating widely.

So far as treatment is concerned, our biggest single lesson has been recognition of the necessity for seeing to it that patients do, in fact, get and *take* every dose of the drugs prescribed. The quinine two days, mepacrine ('Atebrin') five days, rest two days, pamaquin five days treatment has been found to give excellent immediate results, but, like all other known treatments, it fails to cure benign tertian (BT) malaria outright in nearly half of all cases. The standard official treatment has just been changed to an all-mepacrine one like that introduced for American and Australian forces. Before its adoption for our troops was decided upon it was the subject of a most carefully controlled large-scale investigation carried out in Assam by Lieut.-Colonel [illegible] Rogan.

The new treatment is as follows :

Days	*Troops*	*Mepacrine dosage* (thrice daily)
First	British ..	0·3 g.
	Indian ..	0·2 g.
Second	British or Indian	0·2 g.
Third to seventh	British or Indian	0·1 g.

Total mepacrine in 7 days, 3·0 g. for British and 2·7 g. for Indian troops.

Thereafter 0·1 g. once daily for six weeks, or longer if on suppressive treatment.

The new standard treatment is about as effective—if anything slightly better—than the old in the control of fever and the abolition of parasitæmia. Its main advantages are that it is shorter (a week as against a fortnight) and it avoids any break in suppressive treatment.

We have found, like everyone else, that BT malaria is hard to cure and that relapses must often be expected. The main lesson to learn is the right psychological attitude towards this problem. It is that relapsing BT malaria is not a serious matter and should not be regarded as such by either doctor or patient. Provided the attacks are at once controlled by treatment, the patient's health is not damaged and he should be encouraged to make light of it as do tea planters and other residents in malarious areas. Patients are prone to exaggerate the number of attacks they have had and they should not be encouraged to do so or to regard themselves as martyrs. A promptly treated attack of BT malaria should not be given a status exceeding that of a bout of "flu" at home. Malignant tertian (MT) malaria is, of course, another matter and every care must be taken not to miss a fresh MT infection in a man prone to BT relapses.

When a man has had more than three BT attacks within a year, a new special treatment is sanctioned. It consists of quinine gr. 10 thrice daily for ten days together with pamaquin 0·01 g. thrice daily for British troops or twice daily for Indian troops. This treatment is based upon work done in the United Kingdom.

In the last three years we have learned much about MT malaria—learned always to suspect its presence and always to treat it with respect. In this regard Brigadier T. C. Hunt (1944) recently stated some aphorisms which are well worth quoting :

1. In a malarious country headache is not to be regarded as due to psychoneurosis until malaria has been excluded.
2. Malaria with low fever may be more dangerous than with high, because it is more easily missed.
3. To wait for a positive blood slide costs more lives than to treat a suspicious case on an unproved diagnosis.
4. The exact date of onset of malaria is not the same thing as the date of admission to a medical unit.
5. To transfer a case of active malaria without treatment and without full precautions for continuation of treatment is a medical crime.
6. Other diseases do not exclude malaria ; and malaria, especially relapsing malaria, has often some complicating disease.
7. Diarrhœa with blood and fever is not always due to dysentery ; jaundice with fever is not always infective hepatitis : malaria may mimic both. Asthma, fibrositis, neuritis, urticaria, and nephritis are only some of the less well-recognised conditions that malaria may cause, while it may simulate a dozen others.

"*Cerebral malaria*"—i.e., malaria in which cerebral symptoms dominate the clinical picture—has been frequently seen in Assam, Arakan, and Burma. It is likely to be encountered in most future operational areas in south-east Asia. The mortality is high, and every case, even if seemingly mild, is an urgent emergency. The clinical types seen have been :

1. *Cerebral depression ; pre-coma and coma.*—All degrees from drowsiness to deep coma.

2. *Cerebral excitation.*—All stages from mild excitement and talkativeness to extreme restlessness and mania (fighting mad). Fits, generalised or jacksonian.

3. *Behaviour changes.*—Character alterations, irritability, untrustworthiness, depression, &c., developing in previously balanced people. Neurotic and psychotic symptoms are not

uncommon. In areas where MT infection is prevalent, malaria should be suspected as the most likely cause of any oddity of behaviour. Sufferers are not infrequently put on charges because of neglect of duty or acts of insubordination; sometimes they are falsely presumed to be drunk. Many get sent to psychiatrists.

4. *Meningismus.*—Cerebral malaria may closely mimic meningitis.

5. *Focal nervous lesions.*—Any type may occur, resulting in temporary hemiplegia, dysphasia, diplopia, &c. Sometimes a focal spinal lesion may cause paraplegia.

The main lesson to learn about cerebral malaria is that it must be diagnosed and treated without an instant of avoidable delay. Immediate diagnosis is only to be achieved if malaria is always kept in mind as the most likely cause of the syndromes listed above when they are encountered in areas of MT infection. So far as treatment is concerned, the primary measure is destruction of the parasites by intravenous quinine, which is often miraculous in its action. A satisfactory dosage is an immediate injection of gr. 10, followed by further intravenous injections of gr. 6 every four to six hours until the patient seems out of danger.

The nursing care of patients suffering from cerebral malaria is of the utmost importance. Their lives are chiefly menaced by two secondary effects, consequent on disorder of cerebral function, namely: asphyxia and *dehydration. Asphyxia occurs in comatose cases* from the tongue falling back, from gravitation of saliva into the trachea, or from the development of œdema of the lungs. Such patients must never be left unattended, and maintenance of the air-way must be as much a matter of unremitting care as with a patient under a general anæsthetic—the cooperation of the anæsthetist is often very valuable. Dehydration quickly arises from reduction or cessation of fluid intake by drowsy, comatose, or disoriented patients who are usually sweating profusely (see further remarks about dehydration in section below on Effects of Heat).

Lieut.-Colonel G. A. Ransome and his associates have been responsibl [illegible] management of [illegible] routine to nurse ... [illegible] have found that it lightens coma, eases respiration, and lessens the frequency of pulmonary œdema; the beneficial effects are presumably due to gravitational decongestion of the brain. Their other innovation has been the use of a transnasal intragastric Ryle's tube as a medium for continuous drip hydration and nutrition (Ransome, Gupta, and Paterson 1944); this has proved life-saving.

DIARRHŒA AND DYSENTERY

This is our Number 2 Problem. In 1944 in the Eastern operational area one man in ten of the total force was admitted to medical units for [illegible] Many more never became bad [illegible] and men with mild diarrhœa di [illegible] regimental medical officers. There has been a tendency for diarrhœa to become epidemic in the monsoon seasons. Last May, June, and July the number of cases in 14th Army probably exceeded 100,000.

At present the only scientifically justifiable classification regarding causation of the cases we have had is a division into a non-amœbic [illegible] minority. The reason is th [illegible] factory selective culture medi [illegible] available. In consequence, [illegible] most instances been confined to determination of the presence or absence of *Entamaba histolytica.* Such series isolations as have been achieved have been on frankly dysenteric stools with exudates. In these a variety of dysenteric organisms have been found with a general tendency for one or other of the Flexner strains to be the causal organism of particular outbreaks. Practically all non-amœbic cases of acute diarrhœa or dysentery have responded promptly to sulpha drugs. This seems strong presumptive evidence for the view that the non-amœbic infections have been ipso facto bacillary. *But the possibility that some* outbreaks may have been due to a virus or other causes cannot be regarded as excluded on the available evidence. Now that suitable media are being supplied further data will soon become available.

The proportion of patients, among those admitted to ALFSEA medical units, in whom amœbæ have been found has been almost exactly 20%. This incidence is not derived from the entire admissions for 1944 but from two-thirds of them for which the figures were available at the time of writing. The incidence among the milder cases, not admitted to hospital, was probably much lower—particularly in the rapidly spreading monsoon epidemics which bore much more the characteristics of bacillary outbreaks. However, the incidence of amœbiasis, though it may not be quantitatively as great as non-amœbic infection, has caused the gravest concern because of its serious effects on the individual. In this theatre amœbiasis has been the most important single cause of protracted illness and invaliding.

The seriousness of the non-amœbic infections lies in their potentiality for giving rise to rapidly spreading epidemics. Such outbreaks can temporarily incapacitate divisions, corps, or indeed a whole army if the infecting organism chances to be of virulent type. *Even the milder infections are serious* when epidemic, because they cause debility in large numbers of men and so undermine morale. Fortunately, the efficacy of the sulpha drugs is such that, provided they are in adequate supply, no outbreak should now ever get out of control.

In regard to the prevention of diarrhœa and dysentery two main lessons have been learned—the vital importance of hygiene and the great value of the early use of sulpha drugs.

Full application of the principles of hygiene is of the utmost importance, particularly in the provision of uninfected water and food, sanitation, and anti-fly measures. Unfortunately men tend to become slack about hygiene just when they most need its protection because they cannot afford to be ill—i.e., when engaged in active operations against the enemy.

Water is not usually rated as of much significance in the spread of bacillary infection. I would like to enter *a plea for revision of this* view in so far as this theatre is concerned. The highest incidence of bowel disorders occurs in the monsoon season, of which the outstanding feature is torrential rain. Topley and Wilson (1936) reflect the usual opinion in their statement: "Under exceptionally favourable conditions, it is possible that bacillary dysentery may be water-borne, but the evidence [illegible] often deter- [illegible] conditions of [illegible]. The jungle confines very large numbers of men to a few tracks or roads. These routes soon become fringed by bands of soil intensely contaminated with excreta. Rain must carry fæcal organisms into every adjacent stream or pool, and from these sources men tend to draw untreated [illegible] sanitary dis- [illegible] the conditions [illegible] monsoon it is hard to maintain such a high standard. The attempt to do so is not likely to be very wholehearted until the danger is generally recognised.

Chlorination, properly carried out, will kill dysentery bacilli, but unfortunately cannot be relied on to destroy amœbic cysts. There is no doubt that much amœbic infection is contracted through water. Boiling is safe but often not practicable. There is extremely urgent need for a method of water sterilisation, feasible for forward areas, which will destroy amœbic cysts.

The preventive value of the sulpha drugs lies in their action in rapidly reducing the number of pathogenic bacilli passed in the stools of infected men. In this way [illegible] greatly dimi- [illegible] who develops [illegible] t of a sulpha [illegible] second loose stool. This may be achieved if men are educated to report diarrhœa at once to the regimental medical officer. Men cut off from easy access to a medical officer should be given personal supplies. In this theatre *sulphaguanidine, because of its low toxicity* and freedom from renal complications, has been regarded as the sulphonamide of choice. It has been found effectiv [illegible] The initial dose is 6 g. followed by 3 g. four-hourly [illegible] the stools are normal and then 3 g. thrice daily for days. Men must be instructed to chew the tablets and not swallow them whole. The early use of sulpha drugs not only checks the spread of infection but it also cures men before their fitness is reduced. Only a few need come off duty. The great value of the early use of sulpha drugs as a major *preventive* measure in reducing ground contamination in epidemic bacillary bowel infections was first demonstrated by Brigadier Hamilton Fairley in the south-west Pacific area.

The use of sulpha drugs to eliminate bacillary infection can be extended beyond the immediate treatment of actual cases. The American investigators Tenbroeck and Dammin (personal communication) have found that recurring outbreaks of bacillary dysentery in a unit mean a high carrier-rate and that the simplest way to stamp out the trouble is to treat all the men in the unit irrespective of whether they have symptoms or not. Tenbroeck and Dammin use sulphadiazine and give an initial dose of 2 g. followed by 1 g. twice daily for four days.

The treatment of bacillary infections, thanks to the sulphonamides, is no longer a problem. It is a very different story with amœbic infection, which may be very difficult to eradicate. The main lessons we have learned are that likelihood of success in treatment depends primarily on how early the infection is tackled, and secondarily on the thoroughness of the first attack on the amœbæ. Every effort must be applied to eliminating delay in the detection of amœbic infection. Any man with a diarrhœa, not cured by sulphaguanidine within five days, must be sent back to the nearest field ambulance or other medical unit where the microscopic examination of just-passed stools can be arranged; not less than six stools should be examined. If *E. histolytica* is found, the man must forthwith be started on a thorough course of treatment including emetine by injection, emetine bismuth iodide and carbarsone by mouth, and chiniofon by retention enemas.

In this theatre bacillary and amœbic infections often coexist, and any particularly acute attack, in which *E. histolytica* is found should be suspected as being possibly an attack of bacillary dysentery affecting a patient harbouring amœbæ. In such patients there is rationality in blunderbuss therapy—the giving of a course of sulphaguanidine while emetine is being administered.

SKIN DISEASES

In 1944 in ALFSEA one man in every twenty was admitted to hospital on account of skin complaints, and many minor cases, of course, never reached a medical unit. In hot humid climates, such as lie before our forces, skin affections can be a menace rivalling even malaria. The conditions most commonly encountered are intertrigo, fungus infections of the feet and body, prickly heat, scabies, and impetigo.

The answer to the skin problem is organisation and then still more organisation. There must be organisation of facilities for bathing of bodies and washing of clothes and for distribution of dusting powder. There must be organisation of treatment, particularly of early treatment. As everyone knows, a skin lesion treated at its very beginning can be cured easily, whereas if it is allowed to progress, even for a few days, it may take months to cure. This is one of the particular spheres where the good regimental medical officer makes such a difference—the man who is constantly watching the skins of the troops under his supervision. One MO of a column on the first Wingate expedition inspected all the men daily for scratches, sores, or patches of dermatitis. By so doing he was able to deal immediately with the trivial lesions, so common in the jungle, which can make a man a casualty. If that can be done behind the enemy, it can be done in front of him.

Above all, we should organise education and propaganda regarding skin diseases—education of the medical officers and of combatants. A tremendous drive is needed. For it dermatologists are required. There should be a dermatologist with every corps—preferably with every division—charged with specific responsibility for carrying out the organisation outlined. There should be dermatologists for hospitals on a scale of one per 2000 beds. At present we have only a fraction of the dermatologists so badly needed.

SCRUB TYPHUS

Scrub typhus has affected our forces and caused concern. The dramatic name "typhus," and the serious nature of the illness are apt to cause its importance to be exaggerated. In 1944 the incidence closely approximated to one man in every hundred of those at risk. The mortality has been around 10%—i.e., the chance of death from scrub typhus has been one in a thousand. The condition has been the subject of much careful clinical study and of intensive research. The Army has been fortunate in assistance from Medical Research Council workers headed by Dr. R. Lewthwaite.

The chief lessons we have learned are these: First, how to diagnose it: all of us now know its easily recognised clinical picture of 2–3 weeks fever, drowsy apathy, congested face, generalised lymphadenitis, a local eschar, the rash, frequently chest symptoms, and, finally, the characteristic Weil-Felix reaction. Secondly, we have learned that typhus patients must not be moved except in the first few days of illness. Thirdly, we know that the essentials of treatment are good nursing, a cool ward, the maintenance of fluid and salt balance, adequate nutrition, and oxygen at the onset of cyanosis. Fourthly, we have found that typhus cases always come from malarious areas and that the two diseases so often coexist that it is dangerous not to give, as a routine, a course of antimalarial treatment to every typhus case.

The condition has a patchy and uncertain jungle distribution all the way to, and including, Japan. The areas of heaviest infection may well lie behind our own troops. However, the medical directorate is wisely proceeding on the reverse assumption and the most energetic counter-measures are in train and will, it is hoped, afford a high degree of protection.

INFECTIVE HEPATITIS

Infective hepatitis has been a problem, but fortunately has never assumed the dimensions it has in other theatres, such as the Middle East.

It now seems to be fairly well established that the so-called arsenical jaundice, following arsphenamine treatment for syphilis, is nothing to do with arsenic but due to the transmission of the causative agent by syringes infected by the withdrawal of blood from previous patients who harboured it. It seems possible that transmission may also be by subcutaneous inoculations. For example, an outbreak of jaundice occurred in a brigade of "Chindits" about two to three months after they had all received anti-cholera inoculations; it seems just possible that some of the syringes used for the inoculations may have been infected. There may here be an important lesson to learn.

EFFECTS OF HEAT

Much unsatisfactory terminology has gathered round the effects of heat on the body. The key to understanding is to discard nomenclature and think in terms of the main mechanisms by which the body is seriously injured by very hot climatic conditions. These mechanisms are:

(1) Loss of water and sodium chloride from profuse sweating.

(2) Over-heating—i.e., a body temperature of 105° or more.

The former is much the commoner. A man doing muscular work in the tropics may lose 2–4 gallons (9–16 litres) of sweat per 24 hours. Even sedentary persons may lose 1–1½ gallons, and this, be it remembered, includes the sick.

Dehydration.—Excessive sweating causes dehydration which is of two types:

(a) *Primary*, due to simple water lack. This in mild degree causes much inefficiency, but, owing to the development of thirst, does not go far in healthy men with access to water. It may progress to death in a few hours in the sick who are too enfeebled to clamour for drinks.

(b) *Secondary*, due to salt depletion. The body's retention of extracellular water depends on salt. This type of dehydration is much the more important in the tropics and is responsible for practically all fatal cases grouped under the nebulous term "heat-exhaustion." It is characterised by *absence* of thirst, and indeed attempts to take water induce nausea and vomiting in severe cases. The patient's condition is similar to that seen in a crisis in Addison's disease. It can often only be relieved by 4–8 litres of parenteral normal saline.

Prevention of water and salt depletion in troops training or fighting in severe heat is most important. Men must be encouraged to drink freely. Salt should be added to all
¼ oz. per gallon or
strength as in swe
are inadequate. The only completely satisfactory way to correct the salt depletion of excessive sweating is to give a man what amounts to sweat to drink. Saline of this strength (roughly 1/3rd physiological) is not unpalatable.

Dehydration, whether primary or secondary, is the commonest complication of all serious medical or surgical conditions in the tropics. *Too often are its* manifestations of weakness, feeble pulse, and low blood-pressure mistakenly ascribed to toxæmia. Hence, an essential part of the care of any seriously ill patient is measurement eight-hourly (a man may die of undetected dehydration if the period is 24 hours) of the urine volume and salt content. The salt content can be determined by the following simple test:

> Ten drops of urine are measured into a test-tube with a fountain-pen filler. One drop of 20% potassium chromate solution is added. With the same pipette as was used for the urine, 2·9% silver nitrate solution is added drop by drop—the tube being shaken after each drop. The end-point is a colour change from yellow to brown. The number of drops of $AgNO_3$ equals the number of grammes of NaCl per litre of urine.

The aim should be an output of not less than 15 oz. per eight hours and an NaCl content of 6–12 g. per litre. Incidentally, the above test for urinary NaCl is of great diagnostic value in hot weather in differentiating salt-depleted heat-exhaustion from other diseases; in the former the amount is less than 3 g. per litre.

One consequence of the ever-present tendency of patients to develop dehydration is that use of the insoluble sulpha drugs carries more danger of urinary complications than in temperate climates. We have had many cases of anuria from sulphapyridine which has hitherto been our routine sulphonamide because the one in greatest supply. Sulphathiazole, sulphadiazine, and sulphamerazine are all similarly insoluble. It is hoped soon to obtain sulphamezathine in large quantities and to encourage its use because it is considerably more soluble than the others while appearing to be as effective and less toxic. Urine measurement is thus doubly important when patients are receiving sulphonamides. The eight-hourly output should then *be not less than 30 oz.*

Over-heating (heat stroke) presents as its essential feature a body temperature of 105°–112° F. The cause is partial or complete cessation of sweating. This is almost invariably due to an infection (often mild) which sets in motion the fever reaction—a reaction consisting of inhibition of heat-loss mechanisms. The patient is confused, delirious, maniacal, or comatose. His skin is dry and burning. The face is congested and may be cyanosed. The essential treatment is to cool him at once and wherever he happens to be. The most effective method, unless atmospheric humidity is very high, is to strip him naked, wrap him in a wet sheet, and then play fans (or flap towels) over him.

Treatment of the causal infection must never be forgotten. The possibility of its being malaria, primary or relapse, is sufficiently great for it to be wise practice to take blood slides at once and to give every case an immediate intravenous injection of gr. 10 of quinine pending examination *of the slides and clinical* search *for* signs of infections other than malaria.

NUTRITION

The feeding of the troops in the Assam-Burma area has always been a tremendous problem, particularly in the monsoon seasons, because of the wildness of the country and the very difficult and extended lines of communication. Considering the difficulties, it has been wonderfully *well done. Latterly* a *great part* has been played by air-supply. Our supply organisation has been much superior to that of the Japanese. This has been clearly demonstrated by the state of nutrition of Japanese prisoners.

In general the nutrition of British and Indian troops has been very good and practically no primary malnutritional syndromes have occurred. Two groups of cases have, however, been observed which may be regarded as states of malnutrition secondary to the effects of disease—spruelike syndromes seen in both British and Indian troops, and anæmia seen almost entirely in Indian troops.

The spruelike patients have complained of diarrhœa, sense of distension, loss of appetite, sore tongue, and weakness. They have shown loss of weight, glossitis, abdominal distension, and anæmia. Their stools have been pale and have tended to contain an excess of fat when the patient has been on a normal fat intake. A course of sulphaguanadine has usually considerably lessened the diarrhœa but not completely cured it. These cases probably begin with an infective diarrhœa which leads to a vicious circle: diarrhœa—failure of absorption—vitamin-B-complex deficiency—diarrhœa due to deficiency. The development of this circle indicates a suboptimal nutritional state in regard to the B complex.

The essential lesson of these cases is that in regions where diarrhœa is prevalent, which means everywhere in the tropics, the diet should contain an excess of B complex. The War Office has recently introduced a Compound Vitamin Tablet (1 mg. thiamine, 1 mg. riboflavine, 10 mg. nicotinic acid, 25 mg. ascorbic acid) which is issued to all troops on the scale of one per day. This tablet will be a valuable adjunct but should never be regarded as an excuse for failure to insist on diets balanced and generous in all respects.

The essential measures, which should be simultaneous, in the treatment of the spruelike cases (I am using this simple designation to avoid choosing from the many terms which have been invented) are:

1. Course of sulphaguanidine.
2. Exclusion of amœbic infection. Treatment if present.
3. Course of antimalarial treatment. Experience has shown that these patients often have latent malaria.
4. High protein (especially liver), high vitamin, low fat diet of not less than 2500 *calories. It may have to be* given in fluid form by nasal drip in severe cases.
5. Yeast extract ('Marmite' or 'Vegemite') three ounces daily, given in concentrated solution as medicine.
6. Parenteral liver extract in full doses.
7. Six compound vitamin tablets daily.
8. Parenteral injections of 100 mg. nicotinic acid and 10 mg. riboflavine daily.

The anæmia seen in Indian troops appears to be related *to inadequacy of the meat supplied in their* diet. The primary cause is generally malaria, with an element of hookworm infestation in a minority of cases. Very little anæmia has been seen in British troops with as much malaria. The scale of meat for Indian troops is four ounces daily, but it has not usually been supplied more than about once a fortnight. G. H. Whipple (1935, 1942–43) has shown that for hæmoglobin formation visceral and muscle protein is much superior to grains or milk. Vegetarian or lactovegetarian diets may be adequate in central India but are not sufficient in areas where men's red cells are destroyed by repeated malaria or drained by hookworms. Such diets result in little or no bodily reserve of hæmopoietic materials.

The meat deficiency has essentially been due to the difficulties created by scruples of religion or custom, which are rightly completely respected. These scruples make goats and sheep (and only the males at that) the sole permissible animals. Also there must be special *rites of killing for each religion.* The lesson is that
when Indian troops are used
areas special care must be giv
meat either by goats or shee
acceptable canned or dehydrated flesh certified as having been killed according to Hindu or Muslim rites.

The treatment of the cases of anæmia should be:

1. Course of antimalarial treatment—advisable whether or not parasites are found in blood-films.
2. Sulphaguanidine if *diarrhœa is present.*
3. Examination of stools for hookworm ova and, if these present, deworming with tetrachlorethylene—but

before the hæmoglobin has been raised to 10 g. per 100 c.cm. At the same time stools should be examined for amœbæ.

4. Iron by mouth; ferrous sulphate gr. 5 t.d.s.
5. Liver injections in full doses.
6. High protein (especially liver) diet.
7. For patients with less than 5 g. of hæmoglobin per c.cm. an immediate transfusion of 1200 c.cm. of *fresh* blood given by drip over 12 hours.

CONCLUSION

A compressed review such as this does not lend itself to summarising. It is hoped that its brevity, relative to the extent of its subject, may excuse a tendency to dogmatism and perhaps to over-simplification.

So much has been said about the importance of sickness that the impression may have been given that our troops in South-East Asia Command are "riddled with disease." Nothing could be further from the truth. Our men, both British and Indian, are in first-class physical condition and of magnificent morale.

There is much sickness and it causes an enormous waste of man-days, but nearly all of it is of a relatively minor character, not leaving permanent ill effects. This is the very reason why it should be such a challenge to us. The challenge has been accepted and the achievements of the medical services have been remarkable. Sickness is now very definitely under control which is steadily increasing day by day.

I wish to thank Major General T. O. Thompson, Director of Medical Services, Allied Land Forces, South-East Asia, for permission to publish this paper. The views expressed are personal and non-official.

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KNEE INJURIES IN SOLDIERS

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MAJOR RAMC CAPTAIN RAMC
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KNEE injuries are among the more common conditions admitted to a Military Convalescent Depot yet the results of convalescence are unsatisfactory, irrespective of the ætiology of the condition and the type of treatment previously given. The torn semilunar cartilage treated operatively and the case of traumatic synovitis treated by rest made equally poor progress. We have also observed that certain clinical pictures are constantly found in knee injuries with delayed recovery, this again irrespective of ætiology and type of treatment. It is with the clinical aspects of delayed recovery that this paper is chiefly concerned.

The 194 consecutive knee cases admitted to a convalescent depot and examined by us fall into five groups:

Internal derangements, not operated on ..	65
Cases following meniscectomy	47
Gunshot wounds	36
Fractures near the joint	24
Miscellaneous	22
Total	194

The gravity of the situation may be judged by considering the two chief groups and comparing the results recorded by others with those obtained in this series. It would be expected that in the group "internal derangements not operated upon" cases of traumatic synovitis would recover in 2 to 3 weeks with rest and quadriceps exercises (Watson Jones 1943). Sprain of the internal lateral ligament should clear up in 3 to 6 weeks, a longer period being required with rupture of the ligament (Bristow 1935). In our series the average time off duty was 15·8 weeks, of which more than 9 was spent in hospital, and down-grading was necessary in over half this group.

Judging by the results of meniscectomy reported from the Canadian Army (Mackenzie and Macfarlane 1943, Met[illegible] 1944) and from a Scottish convalescent depot (Duthie and Macleod 1943), 70% should be back in their units in category A1 within 10–11 weeks of operation, 6 weeks of this period being spent in hospital. On the other hand, in many of our cases 12 weeks had already elapsed after operation before transfer to the convalescent depot, and a further 6 weeks at least was necessary before they could be discharged—often in a low category.

CLINICAL FINDINGS

Four physical signs constantly recur in cases with delayed recovery. Once again it is emphasised that this is irrespective of ætiology and treatment. They are:

1. Inability to brace back the knee, associated with tenderness in the ligamentum patellæ or insertion of semimembranosus.
2. Tenderness in the scar or internal lateral ligament.
3. Effusion into the joint.
4. Quadriceps insufficiency associated with instability of the joint.

(1) *Inability to brace the knee.*—Of the 194 cases under review, 80, or 41%, were unable to obtain full extension of the knee. In all but 4 of these, points of tenderness were elicited—in the ligamentum patellæ (28 cases), at the insertion of semimembranosus (20), and in both situations (24). In 4 instances the insertion of biceps was tender.

Inability to brace knee with tenderness in ligamentum patellæ.—When the ligamentum patellæ is tender it is generally possible to obtain full painless extension of the knee on passive movement; active extension, on the other hand, is painful and incomplete. In effect, the patient does not fully extend his knee because of pain which arises when the tender ligament is pulled up in the last degrees of extension. The cases under consideration were seen some weeks after the initial injury. On one occasion we saw a number of patients within 2 or 3 weeks of operation; several of them showed a soft crepitus in the ligament, very similar to that felt in achilles tendinitis. We consider it possible that trauma to the knee, operative or otherwise, may sometimes be followed by a tendinitis of the ligamentum patellæ, which in turn gives rise to persistent local tenderness.

Inability to brace knee with tenderness at insertion of semimembranosus.—The clinical picture when there is involvement of the semi-membranosus insertion differs in some respects from that described above. In this syndrome both active and passive extension are painful. In many instances full movement cannot be obtained. As is well known, all patients with severe arthritis of the knee adopt the position of flexion of the joint; this is considered to be the natural response to pain. We have recently seen 2 early cases of acute gonococcal arthritis in a military hospital: in both cases the knees were held in flexion, the insertion of semimembranosus was acutely tender (far more tender than any other part of the joint), and 10 minutes soothing massage to the tender muscle insertion produced almost complete extension of the joint in both instances. Spasm of the hamstrings leading to shortening is evidently an early reaction to injury or disease of the joint.

(2) *Tenderness in the scar or internal lateral ligament.*—Of the 88 patients who had undergone operation or who had wounds of the knee, 48 had painful scars. Leriche (1939) lays great stress on this finding, which he says is liable to develop in regions where normally the skin has little flexibility and little freedom of movement ("la syndrome de la peau trop courte"). In severe cases he has found the painful scar to be accompanied by weakness and even muscular atrophy. In our experience it is exceptional for the whole scar to be involved, the most common site being at the lower end of the incision for an internal meniscectomy. Scars resulting from gunshot wounds are often tender.

Thirty-eight cases showed tenderness of the internal lateral ligament, often at the lower end. This is not in keeping with the findings of Bristow (1935), who says that it is nearly always the upper part of the ligament which is involved. On rare occasions there was tenderness of the external lateral ligament.

(3) *Effusion into the joint.*—Some degree of effusion into the knee is a frequent finding after injury or operation. It is customary and probably justifiable to ignore this when the amount is small and not appreciably increased by exercise. In another group marching or running is followed a few hours later by an increase of

fluid. The most unsatisfactory group is that in which the effusion comes on during, as opposed to after, exercise. Such cases and those with persistent large effusions respond poorly to treatment.

(4) *Quadriceps wasting and joint instability.*—Quadriceps wasting was present in all but 3 cases, 2 being members of the Army Physical Training Corps and the third a glider pilot sergeant. Several soldiers were unable to contract their quadriceps properly; often this was due to a tender ligamentum patellæ; in other cases the art of contraction had been lost, sometimes completely, and re-education had not been carried out adequately in hospital.

Quadriceps insufficiency was closely associated with increased anteroposterior mobility, which was found in 90% of the series and was often associated with some increase of movement in the normal knee. It is open to doubt whether every case of increased anteroposterior mobility should be ascribed to tear or stretching of the cruciate ligaments, though the latter is probably the explanation of the increased movement invariably present with a large effusion. Examples of perfect joint stability in patients whose cruciates have been found at operation to be seriously damaged are reported by Murray (1942) and Caldwell (1943). Watson-Jones (1943) emphasises that joint stability improves in proportion to the tone of the quadriceps; this is confirmed by our experience.

Similarly, the presence of lateral mobility is not necessarily indicative of a tear of the lateral ligament of the knee. It can often be observed that lateral movement obtained with the knee in full extension disappears when the patient is instructed to tighten his quadriceps. The sound knee, on the other hand, does not give this physical sign. Evidently, normal quadriceps tone is necessary to prevent lateral mobility, whereas the poor tone consequent on injury to the knee is insufficient to prevent this movement even when the knee is held fully extended and the lateral ligaments are intact. In the same way anteroposterior mobility *can often be prevented by tightening the quadriceps* with the knee flexed.

TREATMENT

Tender sites.—As a rule, tenderness of the semimembranosus insertion responds satisfactorily to physical treatment. Heat and friction on alternate days seem all that is required. After four treatments a noticeable improvement is apparent, and the patient often volunteers that he is better able to straighten his affected knee. Much depends on the physiotherapist in charge of the case. We have been fortunate in having the assistance of a masseuse who is expert in this form of treatment.

Physical methods are disappointing with the other sites of tenderness. An occasional exception is histamine or iodine ionisation in cases of painful ligamentum patellæ. The most satisfactory method of treatment appears to be the injection of 2% 'Novocain.' Though by no means uniformly successful, it often does good even in cases which have become completely stationary. It must be remembered that symptoms had been present for several weeks in all patients we were treating; it is likely that if novocain had been injected at an earlier stage better results would have been obtained. This would apply particularly to painful scars. Leriche, in fact, advocates routine prophylactic injection of scars in certain situations.

Effusion.—Effusion which develops after exercise can often be prevented if a compression bandage is applied directly after such exercise. The bandage should be retained until the next morning and reapplied after further similar activity. As a rule this procedure need not be continued for more than a fortnight.

Cases with large effusions, and those in which the effusion persistently develops during, as opposed to after exercise, present a very different problem. We have found little in the way of treatment which has any effect in this type of case.

Quadriceps insufficiency.—By the time the convalescent stage has been reached non-weight-bearing remedial exercises are the most useful means of treatment. Weights and pulleys are now popular, but as usually employed, with the patient sitting on a bench, they are unsatisfactory, as the exercise is often stopped with the knee short of full extension. The modification advocated by Duthie and Macleod (1943), with the patient lying prone, is more satisfactory. Static contractions of the quadriceps are often poorly carried out with a tender ligamentum patellæ, and the vastus internus, which is almost invariably the most wasted of the quadriceps group, cannot be correctly exercised when there is limitation of extension of the knee (Nicoll 1943). On rare occasions efforts at obtaining full extension are carried too far, and hyperextension is demonstrable, but this can sometimes be corrected by re-education of the hamstrings.

DISCUSSION

Several questions arise out of the investigation.

(1) Why are our results so bad? How much are they due to the development of clinical states which we have described?

(2) How much is a prolonged period of hospitalisation to blame for the slow and unsatisfactory convalescence?

(3) Should a knee which has been subjected to severe trauma be expected to leave a convalescent depot in category A1?

(4) What should be the disposal of those cases whose progress is unsatisfactory or whose period of disability is likely to be unduly prolonged?

(1) Progress must be unsatisfactory as long as painful areas exist or the knee is unable fully to extend. We believe that the clinical states we have described are important, and we have already emphasised that many of them should be dealt with at an earlier stage than the convalescent depot. There the basic principle is group training; it is clearly unsound to resort to injection or protracted physical measures which not only interrupt the training but also tend to re-create the hospital atmosphere.

(2) Are the bad results partly to be attributed to a long period in "hospital blue" (in a military, EMS, or British Red Cross hospital)? It is significant that Metcalfe (1944) could get 16 out of 20 soldiers back to A1 if they were returned to their units in temporary low category within 3 weeks of operation. We have *found that the longer the period between operation* (or injury) [illegible] alescent depot the longer the [illegible]. There seems to be a tenden[illegible] patients in hospital for a long time after meniscectomy. This may partly account for the recent figures given by Bristow (1941) (50% of 1058 cases returned to unit in A1), results less striking than those obtained by the other observers quoted previously.

The same argument may also apply to the group, "Internal derangements not operated upon." Bristow (1939) points out that long immobilisation after ligamentous strain encourages the formation of adhesions and thus prolongs recovery. As already stated, the average time between injury and admission to the convalescent depot was 9 weeks in our series.

(3) Judging by peace-time results in professional footballers, it appears justifiable to expect soldiers with knee injuries to leave a convalescent depot in category A1—using A1 in its true sense, and not as a synonym for "fit to return to former duty." We have spoken *to a number of footballers* who have had trouble with their knees during their professional career. The story they tell is the same—that they were playing in their first division side 3 weeks after a mild sprain, and 8 weeks, at the outside, after meniscectomy. Only after a severe strain or rupture of the internal lateral ligament were they out of football for 3 months or more. One well-known Arsenal footballer was playing in a practice game 4 weeks, in the reserve side 5 weeks, and in the first division team 6 weeks after an external meniscectomy. All without exception emphasised that early and complete recovery depended largely on their own efforts at building up their quadriceps. This has been borne out by our own experience in the case of members of the Army Physical Training Corps and key personnel of the Airborne Forces; the former have a clear idea of the importance of muscular redevelopment, and the one ambition of the latter is to return to their unit in category A1.

(4) Many knee cases improve up to a certain point, beyond which no further progress is made. In such instances it is waste of time and *demoralising both to the* patient and other soldiers in the depot to persevere in

the hope that a sudden turn for the better will take place. It is much better to downgrade these men and return them to their units as soon as possible. The types of case particularly liable to become stationary are (*a*) those who consistently experience pain on jumping, running, or marching over rough ground; (*b*) those with well-marked joint instability; and (*c*) those with persistent effusion which increases during (as opposed to after) exercise.

SUMMARY

Among 194 cases of knee injury studied at a Military Convalescent Depot, progress was often unsatisfactory, irrespective of ætiology and type of treatment.

Certain clinical features constantly recur in knee injuries with delayed recovery. The most important of these are (*a*) inability to brace back the knee, (*b*) localised areas of periarticular tenderness, (*c*) effusion, and (*d*) joint instability.

Inability to brace back the knee is commonly associated with tenderness of the ligamentum patellæ and/or semimembranosus insertion.

Joint instability is not necessarily due to injured cruciate or torn internal lateral ligaments; it is often due to quadriceps insufficiency.

Tenderness of the semimembranosus insertion responds to frictions. Other tender sites and painful scars are most satisfactorily treated by novocain injection.

Cases with effusion developing after exercise are benefited by the application of a compression bandage immediately after exercise. Those whose effusion consistently develops during exercise make unsatisfactory progress.

Suggested reasons for the unsatisfactory results obtained are: (*a*) delay in treating the clinical pictures described; (*b*) unnecessarily long periods in hospital.

It is justifiable to expect soldiers with knee injuries to leave the depot in category A1.

Early down-grading is recommended in cases where there is little hope of improvement.

We are indebted to Major-General R. E. Barnsley, DDMS Southern Command, for permission to publish this paper, and to Lieut.-Colonel F. G. Kerr, RAMC, officer commanding a Military Convalescent Depot, for providing facilities for the investigation.

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FIELD METHOD OF ESTIMATING MEPACRINE IN URINE

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The demand for a method of estimating urinary mepacrine, suitable for use in the field, may be met by the method described below. Its principle is as follows. The mepacrine is extracted from alkaline urine into ether or paraffin, washed with NaOH, taken into N HCl, and the colour measured against yellow glass discs in a Lovibond comparator. The procedure is an adaptation of previous methods, and conforms to the general principles laid down by Masen (1943) and by Brodie and Udenfriend (1943). Results by this method have agreed well with photo-electric and fluorimetric determinations of mepacrine in a large number of urines from patients taking the drug.

Apparatus.—200 ml. separating funnel; 50 ml. graduated cylinder; Lovibond All-Purposes Comparator or Nessleriser with mepacrine disc covering the range 0·5 to 5 mg. per litre; teat pipettes.

Reagents.—Ether or paraffin oil (kerosene or fuel paraffin); NaOH; N HCl.

d.—To 50 ml. of urine in a separating funnel, add f 10% NaOH and about 100 ml. of ether or paraffin. Shake well, allow to separate, and drain off as much of the urine layer as possible. Wash by shaking with 10 ml. of 10% NaOH and draining off. (The shaking and separating can be done in medicine bottles, by decanting and sucking off, but a separating funnel is much more convenient.) If the colour is to be read in the Comparator, add 18 ml. N HCl; if it is to be read in the Nessleriser, add 50 ml. of N HCl. Shake well, allow to separate, and drain off as completely as possible into the 4 cm. Comparator cells or the Nessleriser tubes. Compare with coloured disc. If globules of ether or paraffin remain suspended in the HCl extract and make the reading of the colour difficult, the extract should be passed through a filter paper.

If the colour is too strong, dilute 1:1 with N HCl and read again.

If the colour is too weak (i.e., less than 0·5 mg. mepacrine per litre), 100 ml. (or 200 ml.) of urine should be extracted with the 100 ml. of ether or paraffin in a 500 ml. separating funnel. The mixture should not be shaken violently, lest an emulsion form; it is sufficient to mix well by gentle inversion (about 1 a second) 30 or 40 times. The rest of the procedure is the same as above, and the result is divided by 2 (or 4).

The Lovibond All-Purposes Comparator, the Nessleriser, and the standard mepacrine disc are obtainable from Tintometer, Ltd. Milford, Salisbury; or from British Drug Houses Ltd.

This method has been developed at the suggestion of the chemical and pharmacological subcommittee of the Malaria Committee of the Medical Research Council. An expenses grant from the MRC to defray the costs of the investigation is gratefully acknowledged. We should also like to thank Major James Reid, RAMC, for his help and advice, and for furnishing us with numerous specimens of urine which he had analysed for mepacrine by the Brodie and Udenfriend method.

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INDIRECT DETERMINATION OF PLASMA MEPACRINE

DURING A THERAPEUTIC COURSE

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Specimens of plasma and urine obtained from patients during a therapeutic course of mepacrine have shown a relation between the concentration of mepacrine in the plasma and the urinary mepacrine and ammonia concentrations which is almost as strict as the relation in subjects on a suppressive mepacrine regime described by the Army Malaria Research Unit (1944). The terms of the relation are different in the two groups of patients, however, and we would wish to repeat the advice of the Army Malaria Research Unit that the terms of the equation be defined with each new regimen of drug administration before proceeding to the indirect determination of plasma mepacrine through observations on the urine.

EXPERIMENTS

The 35 patients used in the first experiment had been on a therapeutic course of mepacrine 0·2 g. four times daily for two days and 0·1 g. thrice daily for four to ten days. The specimen for plasma mepacrine estimation was obtained 12–15 hours after the administration of the last tablet, and the urine was collected immediately after the venipuncture. Plasma and urinary mepacrine concentration was estimated by the double extraction method of Masen (1943) and a Coleman fluorimeter model no. 12 was used to measure the fluorescence. Urinary ammonia was measured by the formal titration method as described by Cole (1933).

The plasma levels in the group ranged from 14 to 75 µg. per litre, and the urinary mepacrine concentrations ranged from 1·3 to 19·3 mg. per litre. When the plasma mepacrine was compared with the ratio urinary-mepacrine : urinary-ammonia, the following regression equation was obtained:

$$PM = \frac{UM}{UNH_3} \times 109 + 27 \quad \ldots \quad \ldots \quad (i)$$

Where *PM* is the plasma mepacrine concentration in μg. per litre, *UM* is the urinary mepacrine concentration in mg. per litre, and *UNH₃* is the urinary ammonia-nitrogen in mg. per 100 ml. The relation found by the Malaria Research Unit at Oxford in patients on a suppressive regime was described by the equation:

$$PM = \frac{UM}{UNH_3} \times 500 \quad .. \quad .. \quad .. \quad \text{(ii)}$$

The difference between (i) and (ii) is shown diagrammatically in fig. 1.

In our results obtained during treatment a better fit for the data was given by the equation:

$$PM = 2{\cdot}30\, UM - 0{\cdot}42\, UNH_3 + 47 \quad .. \quad \text{(iii)}$$

The multiple correlation coefficient between *PM* and *UM* and *UNH₃* was 0·738. The standard deviation of the mean of duplicate indirect plasma estimations was 6 05 μg. per litre.

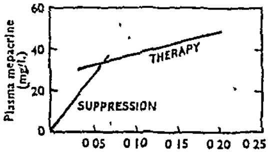

Fig. 1—Effect of difference in mepacrine regime on the relation between plasma mepacrine and $\frac{\text{urinary mepacrine}}{\text{urinary ai}}$

In the second experiment plasma and urine specimens were obtained from 51 patients at the time of admission to hospital and *from 36 patients at the* end of their mepacrine therapy. In the first group mepacrine had

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0 to 35 μg. per litre;

were between 0·03 and 2 50 mg. per litre, and the coefficient of correlation between plasma and urinary mepacrine concentrations was 0·479 ($P<0{\cdot}05$). In the second group 0·2 g. of mepacrine had been given four times daily for two days and 0·1 g. thrice daily for four to ten days. The plasma levels lay between 12 and 100

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$$PM = 7{\cdot}3\, UM + 4 \quad .. \quad .. \quad .. \quad \text{(iv)}$$

whereas in the group on the therapeutic dosage the relation was described by the equation:

$$PM = 1{\cdot}5\, UM + 28 \quad .. \quad .. \quad .. \quad \text{(v)}$$

The difference between (iv) and (v) is shown in fig. 2.

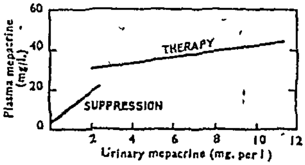

Fig. 2—Effect of difference in mepacrine regime on the relation between plasma and urinary mepacrine.

DISCUSSION

During the standard suppressive regime of mepacrine 0·1 g. daily, and during the therapeutic course in common use, it has now been shown that there is a relation between the plasma mepacrine and the urinary mepacrine, influenced by the excretion of ammonia, which

between plasma mepacrine and urinary mepacrine which

rated in our second experiment. Evidently

e of mepacrine has an influence on the urinary

etion of mepacrine which is as important as the plasma level, for some men have plasma levels during therapy which are no higher than those shown by others on suppressive mepacrine, and such men excrete in the urine much larger amounts of the drug than the men on suppressive doses who show comparable plasma levels.

After a period of field work we are convinced that the indirect method of estimating plasma mepacrine is the goal at which to aim. The direct method involves a venipuncture which must usually be performed by an officer, ten pieces of glass-ware for each specimen, centrifuges, special extraction apparatus, special reagents, and

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mepacrine, and the estimation of ammonia, both of which estimations can be done with the apparatus and reagents already available in a general hospital. With this method many more cases can be investigated with limited personnel, and it is simple enough to be used by general laboratory workers. It can be confidently applied to patients on a suppressive regime or on the standard therapeutic course. Before it is used with patients on a different regime, however, it will be necessary to work out the relevant equation of prediction by parallel direct determinations on a sample of the group involved.

SUMMARY

The existence of a relation between plasma and urinary mepacrine concentrations, influenced by the urinary ammonia concentration, has been confirmed.

In patients receiving therapeutic doses of mepacrine the relation is different from the relation found in subjects receiving suppressive doses.

The indirect determination of plasma mepacrine from observations on the urine is almost as accurate as the direct method and is much simpler and quicker.

Grateful acknowledgement is made to Brigadier F. A. E. Crew for his interest in this work.

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INDIRECT DETERMINATION OF PLASMA MEPACRINE

IN SUBJECTS ON A SUPPRESSIVE REGIME

METHOD SUITABLE FOR A FIELD LABORATORY

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In a previous publication (Army Malaria Research Unit 1944) an account was given of the empirical relation between the concentration of mepacrine in the plasma, the concentration of mepacrine in urine, and the concentration of ammonia in urine. It was found that within the limits of the experimental data (i.e., *PM* lies between 12 2 and 40·2 μg. per litre):

$$PM = K\, \frac{UM}{UNH_3}$$

where PM is the plasma mepacrine concentration in μg. per litre, *UM* is the urinary mepacrine concentration in mg. per litre, *UNH₃*, is the urinary ammonia-nitrogen in mg. per 100 c.cm., and *K* is a constant. When *K* is evaluated, the above relation can be used as an indirect method for the estimation of plasma mepacrine concentration from analyses done on urine only. This paper gives an account of the procedure and a statistical evaluation of the results obtained. The following analytical methods are recommended.

Urinary mepacrine.—Method of King (1945). The urine is made alkaline with NaOH and the mepacrine extracted with ether or paraffin. The extract is washed successively with N

HCl.

discs in

Urinary ammonia.—For the determination of ammonia in urine either of two methods may be used.

1. *Formol titration method.*—The principle of this method is well known and is concisely described by Cole (1933). Amino-acids as well as ammonia are measured by this method so that the figures for formol titration are higher by about 20% than those given by the direct methods

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TABLE I—DIRECT TRIPLICATE DETERMINATIONS OF PLASMA MEPACRINE: AND URINARY MEPACRINE AND AMMONIA (FORMOL AND BASE-EXCHANGE)

Subject no.	Period	EXPT 1 Plasma mepacrine µg./litre (*PM* obs.) Direct determinations	Urine mepacrine mg./litre (*UM*)	Urine ammonia NH_3-N mg./100 c.cm. (UNH_3) Formol	 Base-exchange	EXPT 2 Plasma mepacrine µg./litre (*PM* obs.) Direct determinations	Urine mepacrine mg./litre (*UM*)	Urine ammonia NH_3-N mg./100 c.cm. (UNH_3) Formol	 Base-exchange
261	I	47·0 44·6 29·0	1·50	37·1	32	24·9 40·8 22·9	1·20	58·8	46·0
	II	31·0 31·6 ..	1·03	11·8	11	21·9 22·6 35·0	1·10	13·4	10·0
265	I	39·2 37·2 21·4	0·93	15·9	15	27·8 26·1 21·4	1·05	24·0	20·0
	II	27·4 23·6	0·54	9·2	7·5	30·1 28·6	1·15	22·9	20·0
267	I	35·4 32·8 28·8	3·25	71·3	59	29·4 20·0	0·62	21·0	17·5
	II	28·3 32·0 27·6	1·68	30·9	32	10·2 20·9 21·1	0·38	9·8	8·0
269	I	13·0 20·0 16·0	0·26	9·2	7·5	18·7 11·8 30·3	0·28	8·4	6·5
	II	11·8 13·6 11·1	0·33	11·4	9	7·3 10·4 15·0	0·25	8·4	6·5
271	I	14·5 21·0 11·8	0·30	8·4	7·5	5·7 12·5 15·0	0·2	8·4	8·0
	II	13·9 11·8	0·51	14·7	13·0	14·6 13·9 12·4	0·33	15·5	13·0
274	I	16·3 12·3 13·2	0·38	13·8	13·0	10·8 6·2	0·6	26·5	23·0
	II	15·3 10·7	0·41	13·7	12·0	12·4 8·3 11·1	0·4	21·8	20·0
261	I	23·8 11·8 19·5	0·60	18·1	15·5	8·1 18·2 8·4	0·27	10·9	9·5
	II	19·3 36·2 15·8	0·65	27·8	24·0	17·5 9·8 12·1	0·27	7·9	6·5
270	I	21·5 11·3 9·5	0·50	23·6	17·5	17·5 7·4	0·63	19·6	13·5
	II	19·8 16·5	1·00	39·2	33·5	10·4 17·5 15·9	0·70	19·5	15·0
272	I	32·3 16·4 27·4	0·79	17·0	15·0	32·0 27·2 25·2	0·60	12·8	11·0
	II	23·2 22·8	0·75	18·4	17·5	27·0 45·0 28·0	0·75	16·4	14·0
273	I	23·2 22·3 29·5	0·29	6·3	6·0	15·7 24·5 20·9	0·33	6·0	4·0
	II	23·2 16·7	0·475	9·2	7·5	35·3 58·0	0·40	7·1	5·0

indirect estimation of plasma mepacrine *K* (formol) in the above equation is higher than *K* (base-exchange).

2. *Permutite base-exchange, followed by nesslerisation* (Folin and Bell 1917).—Ammonia can also be determined directly by nesslerisation and comparison of the resulting coloured solution with the standard blood-urea disc of a Lovibond Comparator. Urine contains substances (e.g., creatinine) which interfere with the colorimetric determination. The ammonia must therefore be isolated from the urine. This can be done with permutite (sodium aluminium silicate) which removes ammonia from neutral or weakly acid solutions, the ammonia replacing the sodium of the permutite. If the supernatant fluid is then removed, and permutite made alkaline, the ammonia is again liberated solution, and can then be estimated colorimetrically addition of Nessler's reagent.

TABLE II—COMPARISON OF MEANS OF PM (OBS) AND PM (CALC) (MEAN OF PERIODS IN µG. PER LITRE)

EXPT 1 Subject no.	 *PM* (calc.) Formol *K* (F) = 500	 *PM* (calc.) Base-exchange *K* (B) = 420	 *PM* (obs.)	EXPT 2 Subject no.	 *PM* (calc.) Formol *K* (F) = 500	 *PM* (calc.) Base-exchange *K* (B) = 420	 *PM* (obs.)
264	39·5	33·3	36·5	264	38·4	12·3	27·5
265	29·3	23·6	27·6	265	23·5	23·2	27·7
267	25·0	21·1	30·8	267	16·9	17·3	21·1
272	21·1	20·0	24·2	272	23·2	22·8	30·7
273	24·4	23·4	22·5	273	27·7	33·9	33·5
261*	14·2	13·8	21·1	261	14·5	14·4	12·4
269*	14·2	11·9	14·3	269	15·7	17·0	15·6
270*	11·7	12·3	16·2	270	16·9	19·6	13·6
271*	17·6	14·8	15·1	271	11·2	10·5	12·4
274*	14·4	11·7	13·5	274	10·3	9·7	9·6

* Subjects No. 261, 269, 270, 271, 274 had omitted to take the drug for seven days before experiment 1, and had resumed taking the drug for seven days before experiment 2.

INDIRECT ESTIMATION OF PLASMA MEPACRINE

The subjects had been on a suppressive regime of 0·1 g. mepacrine daily for at least 6 weeks. They were given 500 c.cm. of water to ensure a fairly dilute urine and two specimens of urine were collected at intervals of approximately an hour. The concentrations of mepacrine and ammonia-nitrogen in each sample were determined by the methods outlined above, and the values substituted in the formula.

The mean value of the constant *K* in our experiments was found to be 500 when UNH_3 was measured by formol titration, and 420 when UNH_3 was measured by base-exchange. It is recommeneded that *UM* and UNH_3 be determined in duplicate on each specimen of urine. The best estimate of *PM* is the mean of values calculated for two consecutive specimens of urine. It will be noticed that the calculation is independent of the urinary volume or of the time during which the urine is collecting in the bladder, *for it depends only on urinary concentrations.*

Indirect determinations of plasma mepacrine concentration (*PM* calc.) were made in the manner described above and compared with direct determinations (*PM* obs.) made by a modification of the method of Masen (1943). Ten subjects were used. Two successive 1-hour urine samples were collected from each subject and at the middle of each period sufficient blood (45 c.cm.) was drawn for the direct determination of plasma mepacrine on three separate samples of blood. The experiment was repeated on each subject at the end of a week.

RESULTS

The results of the direct determinations of plasma mepacrine and the urinary analyses are given in table I.

The indirect values for plasma mepacrine (*PM* calc.) were calculated from the formula using either the mean *K* (formol) or *K* (base-exchange) according to the method of estimating UNH_3. The mean of the values calculated for two consecutive hourly periods are shown in table II. It will be seen that the agreement between *PM* (obs.) and *PM* (calc.) is good.

If facilities exist for the direct determination of plasma mepacrine (e.g., Masen's method) the constant *K* in the equation should be calculated in a group of subjects under local working conditions, especially when the regime of mepacrine administration differs from the one described here. For example, since this work was done, a group of subjects on therapeutic regimes has been studied abroad by one of us (G. M. B.); it was found in this group that, while the relation between the ratio of urinary mepacrine and ammonia and the plasma mepacrine concentration held, the value of the constant was lower than that obtained in Oxford.

DISCUSSION

The error of the mean of triplicate estimations of plasma mepacrine was calculated and gave a standard deviation of ± 1·1 µg. per litre. This error may seem large but it should be pointed out that the triplicate estimations were done on three separate extractions of three separate samples of plasma and include among others all the errors that may arise from the fact that up to 80% of the mepacrine in the blood is contained in the white cells. Some of the white cells may remain behind or may be disintegrated on centrifuging and so increase the apparent mepacrine concentration of the plasma. It is because of this that the error of these triplicate estimations is greater than the error of the analytical method as shown by the recovery of mepacrine added to plasma, which we have found to be ± 2·0 µg. per litre for a single extraction.

The differences between PM (calc.) and PM (obs.) in table II include three components. These are: (1) the errors of the direct determination of PM (obs.), (2) the errors of the urinary field analyses, and (3) the errors inherent in the biological relation expressed by the equation. The combined values of the last two components can be assessed by statistical analysis. Thus in the indirect estimation of plasma mepacrine, when the UNH_3 is measured by formol titration, the standard deviation of the combined biological and analytical components (2 and 3 above) is ± 4·0 µg. per litre. When the UNH_3 is measured by the base-exchange method the standard deviation of these components is ± 5·6 µg. per litre.

It will be seen that these values compare very favourably with the standard deviation obtained for the mean of triplic
nination—i.e., ± 1·1
µg. per lit
methods employed
the errors
ealed by this analysis
are surprisingly small.

SUMMARY

A method suitable for use in field laboratories is described for the indirect estimation of plasma mepacrine in subjects on doses of 0·1 g. daily from analyses of urine only.

The errors of this method using duplicate determinations are of the same order as those of the mean of triplicate direct determinations.

Our thanks are due to Brigadier F. A. E. Crew for his interest in this work and to Dr. R. B. Fisher for help with the statistics.

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PERIARTERITIS NODOSA

REPORT OF A CASE

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THE following case of periarteritis nodosa, diagnosed after death, presents some uncommon features, and it seemed worth while to report it even though few pathological investigations were carried out.

CASE-HISTORY

The patient, a man of 43, was referred to the Metropolitan Hospital because of hæmaturia. Four days before admission he had noticed, in the morning, that his urine was dark red. There was then no pain and he continued work until the evening; but during the night he experienced colicky pain in the lower abdomen on both sides. It was not very severe, and there was no increased frequency of micturition. These symptoms were still present on admission.

Four months before he had had "a bad cold," and since then he had had intermittent pains in the left shoulder and loin. He coughed a lot and expectorated a fair amount of sputum; there were no hæmoptyses, though he said he had had a small one ten years before. For 4 months also there had been anorexia and loss of energy, but no pain or discomfort related to meals. He did not think that he had lost any weight. At the age of 17 he had been invalided out of the Army because of severe vomiting attacks, tingling in his legs, and looseness of his teeth. There was no history of venereal disease. He was married and had two children; the first child being a mongol. His father had died from carcinoma of the stomach and his mother from Bright's disease. One brother had died from a thrombosis.

On examination he was a fairly healthy-looking man and his mucosæ were a good colour. Mentally he was noticeably euphoric. His disc edges were blurred and the arteries thickened. To the nasal sides of the disc were patches of whitish exudate. There were no abnormalities in the respiratory system apart from scattered crepitations. His pulse was regular and of a good volume; rate 96 a minute. His apex-beat was 4 in. from the midline and in the 6th intercostal space. The heart sounds were normal and there were no added sounds. Blood-pressure 220/140 mm. Hg.

For 3 days after admission his urine was stained deep red with blood, but on the fourth day it cleared; on the fifth day blood appeared again, but disappeared finally on the 8th day. The specific gravity of his urine varied between 1012 and 1018, and the supernatant fluid of a centrifuged deposit showed a heavy cloud of albumin. In addition to the presence of red cells, microscopy reveal
casional white
ry output was
of the sputum
ercle bacilli.
Bone and his
mucous membrane of the bladder appears to be healthy. Spurts of blood were observed coming from the region of both ureteric orifices. The orifices themselves were not made out, being obscured by the blood, but there was no doubt that the blood was coming from both ureters."

The report on the intravenous pyelogram read: "Control film shows no opaque calculus. Excretion rate fair and equal in both kidneys. The patient is very gassy and a poor view is obtained of the filling on this account. The right kidney is better seen and appears to be within normal limit."

A leucocyte count showed moderate leucocytosis (15,200 cells per c.mm.; 12,000 polymorphs, no report on eosinophil cells, 3000 lymphocytes, and 200 large monocytes).

An X-ray film of the chest showed no abnormality save a general increase of fine bronchial markings indicating chronic bronchitis.

His blood-urea was 40 mg. per 100 c.cm. on two occasions. During three weeks in hospital he lost 6 lb. in weight. There was intermittent pyrexia, but only once did the temperature rise above 100° F. His pulse-rate varied between 80 and 110 during the first week, rising to 110–120 in the third week. The
The blood-pressure
hen there was still
pain in the left side
this was associated
ler blade, eased by eructation.
, though he remained tender in
. On several occasions he complained of moderately severe pain on the tops of both shoulders. On three separate nights he wakened in a sweat profuse enough to make him change his night-clothes. In the most severe of these attacks there was no alteration in the blood-pressure and no increase in the pulse-rate. On the 19th day after admission he complained of severe pain in the left testicle. The only detectable abnormality was an acutely tender epididymis, and the pain disappeared completely during the two following days. On the night of the 22nd day he was awakened by severe pain in the right iliac fossa, this being quite a new symptom; he sweated profusely, his pulse was almost imperceptible, and the rate was 140 per minute. He was very weak but remained clear mentally. There was no respiratory embarrassment; his liver was palpable for the first time, two finger-breadths below the right costal margin. It was not tender. There was some fullness and tenderness in the right iliac fossa but no rigidity. He died within 6 hours.

At autopsy there was approximately 8 oz. of free serous fluid in the pericardial sac. The left ventricle was much hypertrophied, there were no valvular lesions. The coronary arteries seemed to be normal. The aorta showed slight atheromatous changes. No free fluid was found in the pleural cavities. The left lung was bound to the parietal pleura by firm adhesions, and showed some slight venous congestion. The liver was enlarged and showed early venous congestion. The gall bladder was filled by a solitary cholesterol stone surfaced by a thin layer of bile pigments.

Lying behind the peritoneum and over the right psoas major muscle, extending from the liver down to the iliac fossa, was a large bluish-black swelling; when incised this was found to contain about 4 pints of blood-clot, firmly organised at the periphery. On evacuating the clot, the right kidney was seen to be in its normal position and was of a normal size. The capsule had a small rent at its lower pole and through this protruded a firm canalised thrombus. On sectioning the kidney the other end of this thrombus was found to be in a dilated vessel in the cortex. The left kidney was normal. The left testis and epididymis appeared to be normal, though the left spermatic vein was dilated and tortuous. The right kidney, and a portion of the left, were sent for pathological report.

Dr. H. C. Lucey reported that the right kidney showed here and there in its substance what appeared macroscopically to be small cysts filled with blood. Microscopically, these turned out to be dilated blood-vessels filled with organised clot; there was definite periarteritis as shown by small-cell infiltration. There was much clot in the hilum of the kidney, and the left kidney showed similar though milder changes. These histological findings suggested periarteritis nodosa.

COMMENT

The diagnosis of periarteritis was established only by a histological report on the kidneys, but the clinical picture was such that a diagnosis might have been made during life. Characteristic symptoms shown by this patient were cough with expectoration, anorexia, and loss of energy for four months; 6 lb. loss in weight in 3 weeks; macroscopic bilateral hæmaturia for several days; microscopic hæmaturia and cylindruria with albuminuria; intermittent pyrexia; leucocytosis; vague, shoulder, epigastric, and testicular pains; and definite hypertension. The difficulty in reconciling them all with one illness might well have suggested the correct diagnosis.

Microscopic hæmaturia is a common finding, but in an admittedly incomplete survey of the literature we have not found macroscopic hæmaturia often reported. In Jores's (1941) series of 14 cases there were no cases of proved macroscopic hæmaturia though one patient complained of dark urine staining his linen, and in a case reported by Harris, Lynch, and Hare (1939) though present, it was coincident with a bladder papilloma. As a presenting symptom we know of it in only one other case, that of Powell and Pritchard (1932), when the bleeding was so severe that nephrectomy—the bleeding being unilateral—was performed.

Perinephric hæmatomata have been described by Canny (1940) and Mertens (1922). In Mertens's case the hæmatomata were bilateral. Perihepatic hæmatomata have been recorded by Lemke (1922) and Bennet and Levine (1929). Leishman (1937) says that death from a sudden local vascular lesion is by far the least common termination. Death from a profuse hæmorrhage from the liver substance has been found by Cleland (1938) and Klotz (1917); from the cystic artery by Gray (1926); and from the kidney into the perirenal tissues by Harris and Friedrichs (1922).

As a minor point, it is interesting to note the presence of cholelithiasis. This and other disease processes affecting the gall-bladder are often suspected during life in cases of this kind, and are occasionally the subject of unnecessary operations.

SUMMARY

A new case of periarteritis nodosa is described with the somewhat unusual features of: gross macroscopic bilateral hæmaturia as a presenting symptom; death resulting from a sudden hæmorrhage from the kidney into the perirenal tissues.

We wish to thank Dr. J. W. Linnell for permission to publish this case-history and Dr. H. C. Lucey for his histological reports.

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Medical Societies

BIOCHEMICAL AND NUTRITION SOCIETIES

The societies met jointly on April 28 at the London School of Hygiene, with Prof. R. A. PETERS, FRS, in the chair during the morning and Mr. L. J. HARRIS, D SC, during the afternoon session, to discuss

The Vitamin-B Complex

In their introductory survey Dr. HARRIS and Dr. E. KODICEK, of the Dunn Nutritional Laboratory, Cambridge, said that at least a dozen well-defined components of the vitamin-B complex were now recognised, and structural formulæ were known for 9 of these. A biochemical rôle in some specific enzyme reaction was recognised for about 5 of them, and 5—aneurine, riboflavine, nicotinic acid, biotin, and vitamin B_6—had been proved to be needed by man. Two classical deficiency diseases, beriberi and pellagra, were connected with the absence from the diet of vitamin B_1 and of nicotinic acid, and for these two vitamins and for riboflavine some idea of the human requirement had been gained. Vitamin B_1 was one of the few vitamins whose biochemical function in the body was to some extent understood; the first clue to this function was the detection in the tissues of deficient animals and men of abnormal amounts of lactic acid, and, as Professor Peters had shown, of pyruvic acid. Professor Peters was also the pioneer in showing that the influence of vitamin B_1 could be demonstrated in vitro by its power to restore an impaired oxygen uptake to vitamin-deficient tissues. The most promising procedure for assessing the vitamin-B_1 nutrition of man, apart from saturation tests, was a loading test with glucose followed by measurement of tolerance curves in the resulting rise of bisulphite-binding substances in blood or urine. The separation of vitamin B_2, once believed to be a single vitamin, into riboflavine, nicotinic acid, and vitamin B_6 had been followed by the splitting off of pantothenic acid as another entity. Since then further factors had been differentiated—some of them, like biotin, needed by man, animals, and plants; others of a less well-defined vitamin character, like *para*-aminobenzoic acid and inositol, perhaps not directly essential to mammals but able to stimulate their intestinal flora to produce certain true vitamins needed by the host. The various anti-anæmia factors, including folic acid ("vitamin M") and possibly xanthopterin and the extrinsic factor, should also be included under the vitamin-B_2 complex heading.

Mr. J. H. QUASTEL, FRS, of the Rothamsted Experimental Station, reviewed the part played by members of the vitamin-B complex in the enzyme systems, and Mr. F. A. ROBINSON, of Glaxo Laboratories, discussed the characteristics of the various components of the vitamin-B_2 complex.

Mr. B. C. J. G. KNIGHT, D SC, of the Wellcome Physiological Research Laboratories, spoke of the B vitamins as growth factors and growth inhibitors for micro-organisms. He emphasised that the different nutritional needs of various organisms were not an expression of differences in basic metabolic processes but of different ways of acquiring the means to carry out these common reactions.

FERMENTATION AND HUMAN NUTRITION

Dr. B. S. PLATT and Mr. R. A. WEBB, D PHIL, of the Medical Research Council Human Nutrition Research Unit, divided fermentation of food into two categories: that taking place before foods were eaten, and the fermentation of foods left unabsorbed and unutilised in parts of the alimentary canal. The full significance of these changes in relation to human nutrition had probably not even begun to be appreciated, but something was known about their effects on the economy of the vitamin-B complex. Fermentation as a process in the preparation of food was used all over the world, and a wide variety of materials were used for this purpose; alcohol was not uncommonly a product of this fermentation but was by no means always its object. The fermentations utilised in food preparation mainly involved carbohydrates, but in some—the manufacture of cheese, soya sauce, fermented bean curd, &c.—protein was mainly involved. In the production of Kaffir beer, which was from malted grain and unmalted starchy material, fermentation was either carried to the stage of enzymatic saccharification of starch and subsequent bacterial formation of lactic acid and certain B vitamins to yield a product known as sweet beer, the process taking about a day, or was taken further to the stage of alcoholic fermentation by the wild yeasts, this process taking a further 3 or 4 days. In the brewing of Kaffir beer, as in European brewing, germination of the grain and fermentation were accompanied by an increase in the content of the various B vitamins with the exception of vitamin B_1 which was hardly altered. This increase much enhanced the nutritive value of native foods. A maize diet was notoriously associated with pellagra, but this disease was never seen in maize-beer drinkers. In the West Indies, where descendants of African stock were to be found, a recent survey showed a high incidence of minor manifestations of B_2-complex insufficiency; there a fermented sugar drink was taken which was unlikely to be of comparable value to Kaffir beer. A fermentation process of a different kind which it was hoped would materially improve nutrition in the West Indies was the production of food yeast, now being developed on a commercial scale. If a flour of 80% extraction "ennobled" by the addition of 3% of this yeast was substituted for white flour in the West Indian diet the average daily intake of vitamin B_1, riboflavine, and nicotinic acid would be raised from 0·8, 0·8, and 7·2 mg. to 1·1, 1·2, and 10·0 mg. Fermentation in the alimentary canal depended on what materials were left over for the growth of the intestinal organisms, and this was determined by the diet and the extent of digestion and absorption before the residues reached the site of bacterial proliferation. Not only the amount of growth but the composition of the intestinal flora was related to the nature of the food residues; and even with a given flora the products of bacterial action could be considerably altered by changes in the available pabulum—for example, by adding [illegible] a protein medium. As in [illegible] bacteria in the intestine [illegible] the B group, but though the production of vitamin B_1, riboflavine, and nicotinic acid in the alimentary canal of man was established it remained doubtful how far vitamins so synthesised were useful to the host. Alcohol would be expected to appear in the circulating blood if fermentable carbohydrates were not all absorbed before reaching the level at which bacterial action occurred; this expectation had proved correct, and a definite rise in the concentration of ethyl alcohol in blood had been observed within 9 hours after a heavy carbohydrate meal.

B VITAMINS AND ANÆMIA

Dr. **Lucy Wills**, of the Royal Free Hospital, said that a deficiency of riboflavine produced a microcytic hypochromic anæmia in dogs and monkeys but it was still doubtful whether it had the same effect in man. In pigs a microcytic hypochromic anæmia, not hæmolytic in origin, was produced by a deficiency of vitamin B_6. The current teaching, based on the work of Castle, postulated that nutritional macrocytic anæmia was due to a deficiency of Castle's extrinsic factor, and that the blood-changes indistinguishable from those of Addisonian pernicious anæmia were due to the resulting deficiency of the liver principle curative in pernicious anæmia. If that view was correct nutritional macrocytic anæmia should be cured by liver extracts, however given, that were known to be potent in pernicious anæmia. In Bombay uncomplicated cases of nutritional macrocytic anæmia did not respond to purified liver extracts such as 'Anahæmin' and 'Examen,' whereas they responded readily to crude liver extracts such as 'Campolon' or to large doses of 'Marmite.' This finding was compatible with the view that nutritional macrocytic anæmia was due to a deficiency of a factor (or factors) belonging to the vitamin-B_2 complex and not reacting with the intrinsic factor in the manner normally described, though necessary for the proper functioning of the liver principle. In its absence the liver principle would fail to cause the maturation of the erythroblast through lack of an essential component of a cellular enzyme system. Monkeys fed on a diet based on one in common use among sufferers from nutritional macrocytic anæmia developed a similar anæmia which did not respond to purified liver extracts though it reacted immediately to crude liver extracts and to yeast extracts either by mouth or parenterally. The latter result indicated that the curative factor did not require an intrinsic factor to activate it. An attempt to identify it was made first with the late Dr. Clutterbuck and then with Wing Commander Macrae. Vitamin B_1, riboflavine, nicotinic acid, vitamin B_6, and pantothenic acid proved inactive. The outbreak of the war interrupted these studies at a stage when suggestive results were being obtained with liver extracts after removal of the inactive fractions.

MENTAL SYMPTOMS

Dr. **Frederick Prescott**, of the Wellcome Research Institution, raised the question whether the B vitamins [illegible] and not free in the lumen of the large intestine, from which physiological amounts of vitamin B_1 were not apparently absorbed. If the B-vitamins formed by biosynthesis in the gut were absorbed, our views on human vitamin requirements would require revision. Dr. Prescott also mentioned the similar mental symptoms [illegible] e doses of [illegible] of con[illegible] explanation of these symptoms was that the sulphaguanidine disturbed the respiratory [illegible] riboflavine and nicotinic aci[illegible] the metabolism of carbohydr[illegible] by nervous tissue as a source of energy. The mental [illegible] to cerebral anoxia, [illegible] ical sense. Irradia[illegible] ays and radium, the mental symptoms produced by large doses of sulphonamides, anæmia due to the sulphonamides and sulphones, and nutritional anæmia, may all have an ætiological factor in common—namely, lack of the B-complex vitamins, or interference with the respiratory enzyme systems containing them.

TUBERCULOSIS ASSOCIATION

A MEETING held in London on May 11, with Mr. J. E. H. ROBERTS, the president, in the chair, was devoted to

Pregnancy and Tuberculosis

Dr. **M. H. Logg** said it had been estimated that 1½–2% of births were produced by tuberculous mothers. Tuberculosis did not seem to affect the course of pregnancy; prenatal infection was rare, and there was no injury to the fœtus. The effect of pregnancy on tuberculosis was still a matter of controversy. From observation of 500 cases he concluded that improvement was common before the 4th and after the 7th month; the lessening of symptoms might be attributed to metabolic or circulatory changes, or in the later stages to rise of the diaphragm. But hardly any patients were found to be improved three months after their confinement, and in the long run pregnancy was harmful to the woman suffering from tuberculosis. Of one series of cases, 72% showed severe degeneration; but with better methods of treatment in his last 200 cases only 30% suffered serious harm. Primiparæ fared better than multiparæ.

Dr. **Josephine Barnes** reviewed 80 cases seen at University College Hospital, London, of which 21 showed extension of the disease and 11 died within a year of delivery; 51 were delivered normally. She thought that the ultimate prognosis for tuberculous women going through pregnancy and labour was little, if any, worse than it would have been if they had not become pregnant. Facilities for treatment, social and economic factors, and the psychological reaction to pregnancy were important in the conduct of labour. Episiotomy was valuable, and forceps delivery was useful, even [illegible]; cæsarean section should [illegible] of pregnancy should not be [illegible] week; it should not be regarded as a routine but was desirable if the pregnancy had a bad psychological effect on the patient, or if previous pregnancies had been detrimental. Dr. Barnes described a method of termination by injection of sterilised soap paste into the uterus.

Dr. R. COHEN believed that there were many undiagnosed cases of pulmonary tuberculosis among patients attending antenatal clinics, and that the chest should be radiographed as part of the routine of antenatal care. Pregnancy was not the sinister complication it was often deemed to be; a number of active cases were improved after parturition, and all quiescent cases were unaffected. Rise of the diaphragm was probably not as important as restriction of its movement. Pneumoperitoneum was not required.

Prof. F. J. BROWNE agreed about the necessity of antenatal radiography. He thought that in assessing the effect of pregnancy on tuberculosis confusion arose because the patients who became pregnant were on the whole less ill than those who did not.

Dr. LETITIA FAIRFIELD thought that figures by themselves might be fallacious, for one had to consider what the original extent of disease was in each case. No figures told what happened to the cases that aborted early. One must not forget the psychological aspect; marriage often increased the will to live.—Dr. N. ENGLAND pleaded for the combination of the maternity unit with the sanatorium.—Dr. BRIAN TAYLOR and Dr. HUGH RAMSAY both laid stress on the extra worries and strains that assailed the tuberculous women with a family.—Dr. A. STEPHEN HALL quoted the saying that "the load in the crib is greater than that in the womb." But there was no doubt in his mind that pregnancy had a detrimental effect.

Replying, Dr. LOGG pleaded for the tuberculosis scheme to include adequate facilities for the care of a woman from the beginning of pregnancy till at least six months after it.—Referring to the points made by some speakers, Dr. BARNES protested that one or two children did not imply having a large family.

Reviews of Books

Pathogenesis of Tuberculosis

ARNOLD R. RICH, MD, associate professor of pathology, Johns Hopkins University, Baltimore. (Baillière. Pp. 1008. 58s.)

THIS important reference book sets out the basic facts about tuberculous infection. Professor Rich discusses the life-history of different types of tubercle bacilli and their chemical composition; infection, resistance, hypersensitivity, and desensitisation of the host; and the application of the principles of pathogenesis to tuberculosis of the lungs, meninges, and serous cavities, and to the decline of mortality and the outlook for the future. It would have fortified the reader if there had been at the close a comprehensive summary of the whole carefully argued 900 pages.

The claim that the avian strain may be the causative factor of Hodgkin's disease, or Boeck's sarcoid, or even of other diseases of unknown ætiology, is effectively disposed of. The chapter on the bovine strain is an object lesson in what can be done in preventive medicine. The incidence of positive reactors in herds in the USA has been reduced from 4·9% in 1918 to 0·3% in 1941. Professor Rich criticises the bad record of the British Isles, where, he says, "human tuberculosis of bovine origin is proportionately more common than in any other civilized country in the world."

In his opinion virulence is determined primarily by the ability of the bacterium to propagate itself progressively in the tissues of the body; there is no basis for linking virulence with toxin production, and when we speak of the virulence of the tubercle bacillus we should think in terms of its power of reproduction and not of capacity to produce toxins. There is no evidence, he points out, that any strains of tubercle bacilli elaborate an exotoxin or an endotoxin for the normal body; but once infection has made the patient hypersensitive both tubercle bacilli and tuberculoprotein act as though highly toxic. He finds no parallelism between hypersensitivity and the antibody titres for opsonin, agglutinin, precipitin, and complement-fixing bodies. Effective acquired resistance, he reminds us, can be established without hypersensitivity; and he considers that no satisfactory demonstration of the value of protein hypersensitivity has so far been produced. Why, for instance, are native races hypersensitive yet poorly resistant? Why is hypersensitivity sometimes deleterious, sometimes indifferent, and sometimes beneficial in its effect? He discards the word allergy altogether.

The book leads us from the half-truth that tuberculosis is a local disease to a wider conception of pathogenesis. Despite the spectacular decline in tuberculosis mortality in western countries since the turn of the century or earlier, Professor Rich is not prepared to say that the disease will die out. Subclinical or carrier infection is still so common that the infecting case can rarely be traced, and the better our laboratory methods become, the more sputa are found to be positive.

Fractures and Fracture Treatment in Practice

(2nd ed.) KURT COLSEN, MD. (Witwatersrand University Press. Pp. 154. 12s. 6d.)

IN the preface the author informs us that this short account of the essentials of fractures and their treatment is written for the benefit of [illegible] for their final examinations [illegible] to revise the subject quickly. The most valuable contribution that a book such as this can make is to give a clear explanation of how fractures, and the deformities that accompany them, are produced, and here Dr. Colsen has been successful. Good line drawings provide information that could not be conveyed in words, and the text itself is concise and not overburdened with practical details of technique. Some of the treatment advised, however, is open to criticism. The general use of local anæsthesia for the reduction of recent fractures is not favoured in Great Britain, and the dangers of the skintight plaster might well have been given more weight in a book written primarily for students. Sayre's method of treating clavicle fractures has so many disadvantages that it hardly deserved a place, and the complications of skeletal traction through the lower end of the femur need greater emphasis. The treatment of unstable tibial fractures by continuous skeletal traction with a weight of 10–15 lb. on a Braun's frame without plaster immobilisation is unsound, and is likely to produce distraction, a common cause of delayed union in tibial fractures. But all these criticisms apply to somewhat controversial subjects, and do not greatly detract from the value of the book as a whole.

A Synopsis of Medicine

(8th ed.) SIR HENRY TIDY, KBE, DM OXFD, FRCP. (Wright. Pp. 1215. 30s.)

THIS, "the coach's bible," celebrates its silver jubilee by appearing in its eighth edition. Valiantly trying to save it from middle-age spread, Sir Henry has pruned his material to allow space for recent advances; and even so he has had to omit any reference to penicillin. The new edition is as comprehensive, reliable, and concise as ever. The time has come, we suggest, to forgo the administration of pulv. jalap co. in the treatment of acute nephritis; and it is odd that the significance of changes in the retinal arteries in essential hypertension should have been omitted. But in general this work is just what it claims to be—a "synopsis" which will be a welcome aid to many in time of trouble.

Medicine and Mankind

ARNOLD SORSBY, FRCS. (Watts. Pp. 116. 2s. 6d.)

THIS book shows man as part of his environment—climatic, occupational, bacterial, and social—and life as a balance of processes which have to be kept in equilibrium. These processes are not conducted wholly within the body: a greater or lesser part of them take place in the environment. Control of environment, in its widest sense, is of vital importance, and is not so well managed as it might be. The book sets out well the need for what is nowadays familiar as "social medicine," though as an abridged edition of a larger work it has inevitable shortcomings from the point of view of the non-medical or non-scientific reader.

CORRIGENDUM.—In the leading article of March 31 on globulin in the control of measles, reference 4 should read: Greenberg, M., Frant, S., Rutstein, D. D. *J. Amer. med. Ass.* 1944, 126, 944.

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THE LANCET

LONDON: SATURDAY, JUNE 2, 1945

Food Cuts for Victors and Vanquished

NOBODY supposed that the return of peace to Europe would at once remove the food shortages which have steadily increased in the occupied countries during the years of war. The local famines due to German rapacity and to lack of transport—as in Greece and Holland—can be relieved as soon as railways and roads once more ensure even distribution. But there is a continental—and indeed world—shortage of foodstuffs which cannot be corrected until agriculture and manufacture are once more in normal production[1] The "world deficits" in meat, fats and oils, and sugar for 1945 are each estimated at 1½ to 2 million tons[1]

To save the situation and release more food for those who have come near the starvation level, the rations of the civil population in the United States, Canada, and Great Britain are being reduced. The annual consumption of meat per head is to be reduced in the USA from 162·9 to 125 lb. (23·3%), in Canada from 149·1 to 135 lb. (9·5%), and in Britain from 115 to 106·4 lb. (7·5%). Sugar consumption is to be reduced to the same average level in the three countries, and the deficit in fats and oils is to be shared proportionally In this country, which will have the smallest reduction, the weekly rations were cut last Sunday by an ounce of cooking fat and an ounce of bacon, though the fat is to be restored later in the year. There is likely to be less fresh as well as less dried milk for adults, but the milk in schools and for expectant mothers and invalids is to be maintained, as are school meals and the vitamin supplements. The slight reduction in total meat-supplies—from 115 lb. per head in 1944 to 106·4 lb. in 1945—should be more than offset by the increase in fish resulting from the reopening of the North Sea fisheries, though a spate of fish at the ports is of no use if the fishmonger's shop stays empty. Large quantities of fresh imported fruit are expected; and home-grown fruit and vegetables should this year be better distributed. But unfortunately our bread will be a less good source of B-complex vitamins and iron than heretofore. On another page, MORAN and DRUMMOND report a disturbing falling-off in vitamin B_1 and riboflavine as revealed in the preliminary analyses of commercial 80%-extraction flours. Compared with the 85% extraction maintained from 1941 until January of this year, the fall in vitamin B_1 has been from 0·98 to 0·80 i.u. per gramme, in riboflavine from 1·3 to 0·85 μg per g., in nicotinic acid from 17 to 16 μg. per g., and in iron from 2·07 to 1·65 mg. per 100 g. Meanwhile the fibre has been reduced to 40% of its previous level and the colour has become as near white as makes no matter. Whether the attractions of a whiter loaf, with less bran, balance the loss of essential ingredients is so doubtful that the Government ought to consider a return to the 85% extraction at least until Britain is once more enjoying the mixed diet of peace-time. "If we find that we are wrong," said Lord WOOLTON[2] in the House of Lords, explaining the reduction in extraction, "we shall have no hesitation in saying that we are wrong and in going back." If the Ministry of Food expected a negligible loss in B vitamins they have been proved wrong.

There is some evidence that dryness of the skin may arise in susceptible human beings on a diet low in fat.[3] But while the present butter and margarine rations are maintained we are unlikely to meet with serious symptoms of fat deficiency in the United Kingdom. The loss of some 360 calories a week by the cut in cooking fats is relatively unimportant in a country where bread and potatoes are unrationed and people can therefore raise their calorie intake to whatever level their means and taste allow. Very different is the position in Continental countries where there is a shortage of all sources of energy. For the Germans, it is stated, the policy of the British occupying authorities in the coming months is to set the rations only just above the starvation level, and to continue on this basis until all the looted or hoarded foodstuffs have been consumed.[4] The ration cards issued entitle their holders to draw each week "a few pounds of potatoes, a few ounces of sugar, two ounces of [illegible]ead to support life." [illegible] 3½ ounces of domestic [illegible] other unspecified foodstuffs, every third week. All milk is to be reserved for children and expectant mothers. The calorie value of the ration is estimated at 1400 daily—a little less than enough to maintain body-weight in a man at rest in bed.[4] Moreover, unlike our own rations, which represent only half our food consumption, the German rations cover all the essentials of life. In the coming months the Germans will presumably have to work as they have never worked before if they are to get their agriculture and essential manufactures enough into working order to support themselves. If the farm labourer or factory hand can in fact double his rations by drawing on hoarded reserves he will be able to do a hard day's work; if not, the occupying armies, living largely on German food, may have the unpleasant task of inducing the workpeople to carry out tasks for which they are physiologically unfitted. If the food for an adequate working diet for the Germans cannot be found except by making their victims go short, then it is just that the Germans should suffer; but if and when there is enough food for a working diet throughout Europe, common sense suggests that the Germans should get their share.

Estimation of Mepacrine

ONE of the most important new conceptions introduced into therapeutics during the last ten years is the idea of controlling the administration of drugs by estimating their concentration in the blood. This procedure was first introduced for sulphonamides by FULLER and by MARSHALL and his colleagues, and its implications for these compounds were fully explored by the latter group of workers. They emphasised the need for a large initial "loading" dose to raise the blood concentration quickly to the desired level, for appropriately spaced maintenance doses to keep it at this height, and for blood-concentration determinations in patients who did not respond readily to treatment in order to detect those who required an abnormally high dosage to reach the therapeutically effective level. These methods and conceptions proved so valuable in the development of sulphonamide therapy that they have been applied to many other chemotherapeutic remedies, in particular to antimalarial compounds.

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[1] See *Times*, May 21, p. 2.

[2] *Hansard*, Feb. 21, 1945, p. 203.

[3] Smedley-MacLean, I. *Lancet*, 1944, i, 102.

[4] *Manchester Guardian*, May 17, 1945, p. 5.

In 1942 the loss of Java and its quinine supplies necessitated a change to the synthetic antimalarial product, mepacrine ('Atebrin'). Since this would have to be the mainstay for Allied forces operating in malarious areas, its properties were studied intensively, first in America and later also in this country. This study has led to the conclusion that in many ways mepacrine is superior to quinine as an antimalarial agent, especially in its effectiveness against malignant subtertian malaria. Particular attention was given to the estimation of mepacrine in the blood, and to the guidance to be obtained therefrom for its better utilisation. Methods of estimation were described by MASEN,[1] by BRODIE and UDENFRIEND,[2] and others. The whole subject has been explored in a masterly way by SHANNON and his colleagues,[3] who showed that mepacrine slowly accumulates in the body, that on a daily dose of 0·1 g. full protection against malaria is not attained until after several weeks, and that therapeutic courses of mepacrine ought to begin with large loading doses instead of the previously accepted schedule of 0·1 g. three times daily. Unfortunately the accurate determination of the plasma concentration of mepacrine, especially at the low levels encountered when mepacrine is taken in small daily doses for suppression, is both difficult and delicate. It requires a high-speed centrifuge, a highly sensitive and fragile fluorimeter, much glassware, and a high degree of technical skill and experience. Probably there are only three or four laboratories in this country where reliable estimations can be carried out at present; it is not a procedure which can be performed in the field or in routine laboratories. Accordingly various attempts have been made to produce a simpler method which could be employed in these circumstances and still yield sufficiently reliable results. The main principle of these attempts has been to perform the estimations not on the plasma itself, where the mepacrine concentration is very low, but on the urine, where the concentration is relatively high. Various techniques have been devised. One of the most ingenious is that described by YUDKIN.[4] Another simple and reliable method is given by KING and GILCHRIST in this issue. A third method, depending on fluorescence produced by direct sunlight, has been devised by Major ADAMSON (unpublished), who used it to make observations on soldiers within gunshot of the Japanese lines in Burma. Any of these techniques is adequate for all practical purposes in the field.

The relation between the mepacrine contents of the urine and of the plasma is not a constant one, so the estimation of urinary mepacrine is not a complete substitute for plasma estimations; nevertheless it has its uses. The chief of these has been to control the administration of mepacrine to troops. Extensive research, especially in Australia, has shown that if men take 0·1 g. of mepacrine daily, clinical attacks of malaria are completely suppressed. Unfortunately, human nature being what it is, daily consumption of this dose of mepacrine by 100% of the men concerned is very difficult to achieve. Estimation of urinary mepacrine is an indication of how far the regulation dosage of the drug has in fact been observed. In view of the great variation shown by rare individuals, it is not safe to condemn a man because a single examination of his urine has failed to demonstrate mepacrine. But if the urines of an appreciable proportion of the men in a unit do not contain demonstrable mepacrine it is clear that stricter supervision of the taking of mepacrine is necessary. Work by the Army Malaria Research Unit, reported on another page, has shown that the excretion of mepacrine by the kidney is affected by the acidity or alkalinity of the urine. If the concentration of ammonia in the urine is taken into account, the concentration of mepacrine in the plasma can be calculated from observations on the urine almost as accurately as it can be ascertained by direct measurement. Since the mepacrine and ammonia in the urine can be measured by very simple methods, easily practicable in any field laboratory, while direct examination of the plasma requires complicated organisation and instruments, this discovery constitutes a great advance in the much needed simplification of technique. Unfortunately there is some uncertainty as to the exact mathematical relationship between the concentration of mepacrine and ammonia in the urine on the one hand and the concentration of mepacrine in the plasma on the other. The workers of the Army Malaria Research Unit give one equation for this relationship; but two members of the unit, BROWN and RENNIE, who studied the question further in Italy, give several different equations to suit different groups of patients, and results calculated by the different equations differ widely. The difference in the conclusions reached in these two papers is assigned to the different dose schedules of mepacrine, suppressive or therapeutic, which had been followed by the subjects supplying the specimens for examination. It is to be hoped however that the subject will not be left in this unsatisfactory position, especially in view of the excellent work which carried the investigations so near to success. For practical clinical use, a single equation is needed which can be applied to all types of case in which an estimation of plasma mepacrine is desired.

Nursing Staff in Sanatorium and Hospital

FOR centuries Western governments have shown a measure of care and respect for their discarded fighting men; but the man—whether soldier or civilian—who falls sick of a disabling disease still does not rouse effective public concern. Towards the tuberculous, particularly, intentions have been better than performance, as we have tried to show[1]; and commenting on this[2] four seniors of our profession—Dr. J. J. CONYBEARE, Dr. HOPE GOSSE, Lord HORDER, and Dr. GEOFFREY MARSHALL—note that increasing numbers of Service men and women are being invalided with pulmonary tuberculosis, and that the numbers are likely to be augmented from the ranks of returned prisoners. The Ministry of Pensions accepts responsibility for those who develop tubercle

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[1] Masen, J. M. *J. biol. Chem.* 1943, 148, 529.
[2] Brodie, B. B., Udenfriend, S. *Ibid*, 1943, 151, 299.
[3] Shannon, J. A., Earle, D. P. jun., Brodie, B. B., Taggart, J. V., Berliner, R. W., et al. *J. Pharmacol.* 1941, 81, 307.
[4] [illegible]n, J. *J. trop. Med. Hyg.* 1945, 48, 1.

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[1] *Lancet*, March 3, p. 275.
[2] *Times*, April 2.

during war service, but must send them home for treatment, where the standard of care they receive depends on the financial standing of their local authority. The writers of the letter properly feel that all our Service men and women should have the best care available, and suggest that the Ministry of Pensions should be given the responsibility, and granted priorities, for providing and maintaining first-class treatment and reablement centres. Speakers in Parliament have proposed alternatively that the War Office, for example, should open special sanatoria, or that empty beds in EMS hospitals should be used.[3] But provision of an adequate remedial service by whomsoever it is done, turns on the recruitment of ample and competent staff.

At present sanatoriums lack both nurses and domestic workers. Recruitment to all branches of nursing has steadily risen during the century, but has never kept pace with the expanding hospital service; and sanatoriums fare especially badly, partly because they often lie far from towns, and partly because—rightly or wrongly—they carry the reputation of a risk to health. How far this fear of infection is justified we cannot say, because, in dread of making staffing difficulties worse, doctors and public bodies have swerved from publication of decisive figures. It is often argued that since she lives an outdoor life, and is watched for symptoms and treated early, the sanatorium nurse runs less risk from the tubercle bacillus than the nurse in a general hospital. This is no doubt true of the best sanatoriums,[4] but it certainly does not hold good for all,[5] and as an argument it has its unattractive side. In our view the proper way to deal with the public doubt is to collect

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It is best to know the facts and face them.

The Tuberculosis Association has made a useful attempt to raise standards of training in sanatoriums by offering a certificate to nurses passing a simple examination, and it has long urged that nurses holding this certificate should be placed on a State register. To this suggestion, however, the General Nursing Council are opposed, partly because they feel that training required for the certificate does not put the tuberculosis nurse on an equal footing with State-registered nurses, and partly because they fear that to qualify nurses to manage a single disease might ultimately lead to foolish multiplication of supplementary registers. Certainly we need to train practical and reliable nurses capable of looking after any type of patient, and the growing complexity of sanatorium treatment, instead of isolating tuberculosis nursing, is bringing it more closely into line with nursing in general hospitals. The TA certificate, though it has undoubtedly helped recruitment, has not attracted large numbers of women into sanatorium nursing, and it is increasingly regarded as a postgraduate qualification to be acquired by State-registered nurses who take up tuberculosis nursing.

In the main the staffing of sanatoriums cannot be considered apart from the staffing of hospitals as a whole—a problem which invites some degree of reorganisation within the nursing profession. This is almost as much the concern of medical as of nursing leaders, for without good nursing there is neither good medicine nor good surgery. A national nursing service, surely, should be planned at the same time as the National Health Service, as an integral part of it. At present the General Nursing Council supervise the hospitals and sanatoriums they have recognised as training schools, or as affiliated schools: before being recognised, would-be training schools must achieve acceptable standards—which are by no means exacting—in accommodation, teaching staff, and equipment. Hospitals that cannot reach this standard are thus rightly excluded from nursing education; but they are also deprived of any official supervision whatever, and in these, and in some small private nursing-homes, much of the worst nursing in the country is done. To raise the level we need an inspectorate, a central body of experts (which might be one of the standing committees associated with the Central Health Services Council), and also a regional or local organisation, able to see that nursing resources are distributed to the best advantage throughout its area. If the needs of the area are considered as a whole, the sanatoriums will get their proper share. Whether that share is sufficient will depend on what is done to encourage girls to take up nursing. As we suggested last week[6] a two-year course leading to State Qualification, coupled with a well-planned student life in hostels outside the hospital walls, might overcome many of their present objections.

The Demobilised American Doctor

THE American Medical Association, in conjunction with other professional bodies, has set up a Committee on Postwar Medical Service. This committee has made an inquiry among medical officers on duty with the United States Forces, to ascertain their future educational desires.[7] Unfortunately the total number of questionaries sent out is not stated, but 21,029 were returned. In an earlier pilot inquiry, 3000 questionaries were despatched, and a report was published on the first 929 returned.[8] Even in this case, the total return is not mentioned, so arguments by analogy are impossible. No doubt security considerations caused this omission, but it is a pity; as a result, the conclusions must be treated with caution.

Nearly 60% of the group (12,534) wanted to take courses lasting six months or more, on leaving the Forces, while about 20% wanted three-month courses. The ten most popular subjects for the longer courses were, in order of frequency: surgery, internal medicine, obstetrics and gynæcology, a general refresher course, psychiatry and neurology, pædiatrics, orthopædics, ophthalmology, radiology, and otolaryngology. Of the short courses, internal medicine, surgery, a general refresher course, obstetrics, and pædiatrics topped the list. No less than 63% expressed a wish to become certified specialists, and 16% were already certified specialists. Thus only 20% seem to want to cover what we understand as general practice. No doubt broad decisions on policy will be made before the road to specialisation is opened to the great bulk of the younger half of the American medical profession. If these decisions are based on the wishes of those most acutely concerned, a plethora rather than a shortage of specialists is likely to be the order of the day.

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[3] *Lancet*, May 12, p. 611.
[4] Edwards, P. W., Penman, A. C. *Ibid*, April 7, p. 429.
[5] *Ibid*, May 5, p. 570.
[6] *Ibid*, May 26, p. 661.
[7] *J. Amer. med. Ass.* 1915, 127, 7[illegible]
[8] *Ibid*, 1944, 125, 1033.

Annotations

EPIDEMIC OUTLOOK IN EUROPE

PROPHECY should be scheduled as one of the dangerous occupations. Only the other day a committee of the American Society of Sanitary Engineering announced that its *Polio Program Prepares for the Next Epidemic.* Does polio depend on plumbing? Perhaps and perhaps not, but at any rate the society deserves commendation for attempting "to investigate infantile paralysis cases before they occur." This is the principle underlying an admirable essay by Knud Stowman,[1] chief of the Epidemiological Information Service of UNRRA. Stowman points out that in the four years of World War I Europe witnessed a rise in the endemic level of infectious diseases, quite apart from the devastating outbreaks of the major horrors of war. Towards the end of that war typhus, relapsing fever, cholera, malaria, dysentery, and typhoid swept over the continent—and then the influenza pandemic struck, leaving in its trail all the destruction of a hurricane.

World War II is now in its final stages. What is the outlook? What are the facts of the moment? Among the five pestilential diseases, only louse-borne typhus presents an immediate and grave danger to Europe. Cholera still clings to the Asiatic shores; yellow fever, perhaps because of careful precautions, has not escaped from the North African desert belt; and plague is on the leash, straining at Dakar and the Mediterranean ports. The continent of Europe has remained practically free from smallpox during the war, except for the Italian epidemic of 1944 and a few warnings, even in Great Britain. Typhus is the great enemy; it looks as if Soviet Russia, the principal sufferer in World War I, has succeeded in keeping the disease at bay, but there has been an insidious spread in central Europe, and a few outbreaks of epidemic strength, likely to increase during the present summer. Unofficial estimates give a figure of 30,000 cases in Moldavia alone, and the epidemic level is rising also in Bulgaria and Greece. In fact, the typhus-free areas of Europe consist only of Switzerland and the Scandinavian countries. Apart from the menace of typhus the most significant fact of the present epidemic situation is that the incidence of all the common infectious diseases has doubled or even trebled during the past few years. Stowman gives figures for twelve continental countries, comparing the median of 1928–38 with the cases of 1943, and finds the following incidence in units of the pre-war level: cerebrospinal meningitis 3·1; diphtheria 3·0; scarlet fever 3·2; poliomyelitis 2·5; dysentery 2·1; and typhoid fever 1·5. The ominous feature of the position is that there has been an increase in *all* these diseases—in the same year and on a whole continent. So far diphtheria is in the van as a disease and as a cause of death. It is estimated that there were at least a million cases during 1943, outside the USSR, and the case-mortality is about 5%. The contrast with England, where the incidence has fallen, is striking; and the other "immunising" countries—Hungary, Denmark, Sweden, and Switzerland—have also shown a low incidence. Unfortunately the gravity of diphtheria, as well as its incidence, has increased; interstitial myocarditis has been found post mortem in as many as 64% of cases in Germany. The war had no effect, according to Stowman, on the tuberculosis mortality in Europe in 1939 and 1940, but the sinister war increase began in 1941 in several countries and became more or less general in 1942. The situation is now much the same as after the last war, except that the increase this time started from a lower level. Great Britain, Switzerland, and the Scandinavian countries have stood up to the disease very well, but the tale is not yet told.

In general, Stowman says, the epidemic outlook is much the same as it was 27 years ago, but the destruction of dwellings and the displacement of persons makes the future darker than it was in 1918. There remain the unpredictables—the mighty pandemic of influenza is nearly a generation old, and the critical test of the sulphonamides may not be far distant.

PENICILLIN IN ACUTE SYPHILITIC MENINGITIS

CLINICAL neurosyphilis will develop in about a fifth of all untreated syphilitics, and about half of these cases will be of the meningovascular type; in addition, inadequate treatment permits neuro-recurrence. Syphilitic meningitis is therefore not rare, and it may be seen in the early months or years following infection. The exudative process may affect several different areas of the meninges, and symptoms and signs consequently vary greatly in localisation and severity. They include headache, vomiting, blurred vision, diplopia, ptosis, facial palsy, tinnitus, vertigo, slurred speech, epileptiform seizures, pain, and paræsthesias and mental disturbance. The blood Wassermann reaction is usually positive and the cerebrospinal fluid abnormal.

Nelson and Duncan[1] report excellent results from penicillin therapy in ten cases of acute syphilitic meningitis. Four patients were previously untreated and the remaining six were examples of neuro-recurrence following insufficient treatment. The dosage of penicillin given by intramuscular injection in these ten cases varied from 600,000 to 4,000,000 units. The immediate results, judged by clinical recovery and a steady reversal of abnormal findings in the blood and cerebrospinal fluid, lead Nelson and Duncan to suggest that the effectiveness of the remedy depends more on its ability to reach the diseased meninges, blood-vessels, and parenchyma than on its appearance in the cerebrospinal fluid in significant quantity when given by intravenous or intramuscular injection. They believe that intrathecal administration is unnecessary and advise that treatment for acute syphilitic meningitis should comprise a total of between 2 and 3 mega units given by intramuscular injection every 3–4 hours day and night for 8–16 days. The subsequent course of these and other similar cases will be studied with interest, for the immediate results are most encouraging.

PROGRESS IN DIABETES MELLITUS

THE improving outlook for the diabetic is well exemplified in an intensive study of 100 patients who had been followed at one American clinic for at least ten years[2] Ages ranged from 14 to 75, but most of the series were in the sixth and seventh decades. Of the 6 patients who had been in hyperglycæmic coma (3 during the period of study, 3 previously) only one was over the age of 20—a woman of 55 who went into coma after having a carbuncle on her neck—and all recovered. The incidence of chronic infection is interesting: 9 had chronic pyelonephritis, 16 chronic cholecystitis, 9 tuberculosis, and 9 syphilis. The 9 tuberculous patients had made satisfactory progress, only one having a stormy career; a very different story from the grim prognosis associated with this combination of diseases only a few years ago. An equally striking commentary on the progress of the last quarter of a century is the presence in the series of 2 patients with both pernicious anæmia and diabetes, both of whom are doing well. Using the dosage of insulin and the blood-sugar levels as a yardstick, it is concluded that in at least 45% of cases the diabetes had not progressed during the period of study.

An ophthalmic study of these patients[3] showed that complicated cataracts were fewer than among untreated diabetics, and that closely controlled treatment had reduced the incidence of corneal wrinkles. On the other hand, deep retinal hæmorrhages and exudates were found to increase with the duration of the diabetes, and were little if at all affected even by the most careful treatment. The relation between diabetes and hypertension is so often commented on that it is noteworthy in this series that all the patients with hypertension (38) were over [illegible] .ld be found to [illegible] was dependent [illegible] e diabetes. As judged by orthodiagrams only 10 of the 38 hypertensive diabetics had enlarged hearts, and none of them showed he electrocardiographic changes usually found in hypertension and attributed to left ventricular hypertrophy. n investigation of the peripheral vascular system in 89 f the patients[5] showed that only 3 of those under the ge of 50 had evidence of arteriosclerosis, and during the eriod of study not a single patient in the whole series equired amputation—even of a toe.

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[1] UNRRA *Epidemiological Bulletin*, Washington, April 6, 1945.

[1] Nelson, R. A., Duncan, L. *Bull. Johns Hopk. Hosp.* 1944, 75, 327.

[2] Richardson, R., Bowie, M. A. *Amer. J. med. Sci.* 1945, 209, 1.

[3] Leopold, I. H. *Ibid*, p. 16.

The two main conclusions from this experience are that he lot of the diabetic is now relatively happy, and that auch of this improvement is associated with the larger arbohydrate diets adopted during the ten years covered y the survey.

RELEASE OF VITAMINS BY THE INTESTINAL FLORA

THE discovery of the vitamin-synthesising powers of the enteric bacteria has naturally raised the question whether and to what extent these micro-organisms release their vitamins. At the meeting of the Biochemical and Nutrition Societies, reported in this issue, Dr. Prescott doubted whether significant amounts of the synthesised vitamins are absorbed in the gut.

It is evident from the many studies on experimental vitamin deficiencies in animals, induced with the aid of the so-called "sterilising" sulphonamides, that vitamins of intestinal origin must be available to the host organism to some extent, since otherwise bowel "sterilisation" could not result in the observed deficiency syndromes and be cured by the administration of vitamin concentrates or the fæces from similar animals which have not been treated with the sterilising drugs. Production as well as release of intestinal vitamins can also [illegible] elimination of the [illegible] administration of di [illegible] sulphathiazole. Thus Ellinger and Benesch,[6] observing a sharp drop in the nicotinamide methochloride output of persons who had received sulphasuxidine, concluded that nicotinamide must be produced and released by the intestinal flora. Without employing sulphonamides, Mitchell and Isbell[7] at the University of Texas demonstrated by autopsy studies in rats that folic acid, biotin, and pantothenic acid are released by the cæcal bacteria and absorbed by the cæcal wall. The vitamin concentration in the wall of the lower small intestine was considerably less than in the cæcum, which was taken to mean that the small intestine, being relatively free from organisms, was getting these B vitamins from the food only, whereas in the cæcum a considerable proportion was coming from bacteria.

The results of these experiments are well borne out by in-vitro studies. Burkholder and McVeigh,[8] for example, found that in cultures of *B. aerogenes* which had grown for 111 hours about 30% of the biotin, aneurine, and riboflavine, and about 40% of the nicotinic acid produced by the bacteria were present in the filtrate. In a paper on the synthesis of vitamins in pure culture by *Bact. aerogenes, B. prodigiosus, Ps. fluorescens, Proteus vulgaris,* and *Cl. butyricum*, Thompson[9] concluded that with all the eight B vitamins studied, only the amount of the vitamin required for the activities of the cell is retained by the micro-organism; the excess is excreted into the medium. Moreover, the amount of vitamins in the cells showed a remarkable constancy in all the species investigated, whereas the amount outside the cells was much more variable. The extracellular vitamin was, however, considerable in most cases. Thus there was nearly as much aneurine, 2½ times as much riboflavine, 1½ times as much nicotinic acid, and 12 times as much biotin in the medium of aerobic cultures of *Bact. aerogenes* as in the cells of this intestinal organism. The conditions under which the bacteria were grown in these experiments (heavy inoculum incubated for 24 hours only) insured a heavy growth, a rapidly growing culture, few dead cells, and therefore a minimum of autolysis. To obtain further evidence as to whether autolysis was responsible for vitamin release, the biotin liberation by *Proteus vulgaris* was investigated. It was found that biotin release actually paralleled growth, which showed that the vitamin did not appear in the medium as a result of autolysis but was excreted by the bacteria. Nevertheless, these findings do not negative the importance of autolysis in the release of vitamins from micro-organisms both in vitro and in vivo. In the large intestine, where bacteria are autolysed in large numbers, owing to dehydration, &c., considerable amounts of vitamins produced by the organisms under the more favourable conditions higher up in the bowel should be set free in this way.

It seems certain, therefore that although the total quantity of vitamins synthesised by the intestinal bacteria is not available for the use of the host, a variable but significant proportion does reach the host's blood-stream.

MITRAL STENOSIS SIMULATING SILICOSIS

AN example of how mistakes can be made by placing too much reliance on radiological findings is reported from America.[10] A man of 26 was referred for examination in October, 1943, because a diagnosis of silicosis had been made in July of the same year; X-ray films of the lungs had been taken on two occasions, and the changes had been reported as consistent with this diagnosis. For 83 days before July, 1943, he had been working as a catalyst operator in a building where a machine was crushing silica for filter material. The crushing was not considered officially to be a "dirty" operation, and the patient worked some distance from the crusher. X-ray films of [illegible] X-ray films of the lungs revealed a diffuse mottling, heaviest between the hila and the lateral chest walls, although some mottling was also present at the apices and the bases. It was clear, therefore, how the diagnosis of silicosis had been arrived at by the previous examiners. But in view of the short duration of exposure to silica, the freedom of the workmen who had been exposed to much greater risk, and the absence of any clinical evidence of silicosis, it was concluded that the diagnosis was mitral stenosis and that the radiological changes were due to pulmonary congestion. It has, of course, long been recognised that the radiological appearances of pulmonary congestion in mitral stenosis can be most misleading, simulating not only silicosis but also miliary tuberculosis, but this instance demonstrates once again that before making a diagnosis of silicosis the whole picture—occupational, clinical, and radiological—must be carefully reviewed and correlated. The last word in diagnosis must always be with the clinician in charge of the case.

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Special Articles

SCIENTIFIC BASIS OF 80% EXTRACTION FLOUR

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MINISTRY OF FOOD

In the early days of the war when, because of the prospective supply position, a long-extraction National flour was being discussed, relatively little knowledge was available of the nutritional points which would require consideration in framing a precise recommendation. It was known that much of the vitamin B_1 was to be found in the germ, while there was an impression that the aleurone layer was also rich in this vitamin; incidentally the latter view has since been shown to be largely incorrect. The branny layers were known to be rich in iron, but they were regarded as indigestible and known to contain an appreciable amount of phytic acid which may interfere with calcium and iron absorption from the diet as a whole. It was known that the addition of a suitable quantity of chalk would eliminate the immobilising effect on calcium, but how far this would improve the availability of the iron was a matter for conjecture. There was also evidence that the outer endosperm was rich in protein of high nutritive value. On top of this rather vague and incomplete picture of the wheat grain there was, of course, no experience to show how far millers could produce a long-extraction flour combining high nutritive value with good baking quality.

The Accessory Food Factors Committee of the Lister Institute and the Medical Research Council in their first report (1940) recommended that the extraction should be at least 80–85%. In their second report (1941) the committee discussed the specification for 85%, the extraction which the Ministry of Food had meanwhile adopted. They advised that the flour should contain as much as possible of the B vitamins, including riboflavine, nicotinic acid, and especially B_1; in the case of vitamin B_1 the flour should not contain less than 1 i.u. per g. The fibre content of the flour was fixed at a maximum of 0·9%. The fibre is the amount of insoluble residue left after treating the flour with acid and alkali under prescribed conditions (Analytical Methods Committee 1943); the fibre content multiplied by eight gives a reasonable estimate of the bran content of the flour. (The bran includes the aleurone layer, since, during the usual milling process, it is not detached to any appreciable extent.) In fixing this upper limit for the bran (fibre) content of the flour, the Accessory Food Factors Committee urged that it should contain as little bran as possible. Later (June 2, 1942) the Medical Research Council advised that any bran particles in the flour should not have a cross-section exceeding 0 2 mm. Acting on this advice, the Ministry of Food encouraged millers to reduce the bran content of National flour with the result that the average figure dropped from about 6% to 4% (fibre 0·5%) with consequent improvement in colour and baking quality. At the same time, the size of the bran particles in the flour was progressively reduced.

In an attempt to rationalise these nutritional standards experiments were set on foot at the Cereals Research Station to determine with greater precision the distribution of the different nutrients in the wheat grain. This work also had as its objective the milling of a natural flour of the highest nutritive value having at the same time a pale colour and good baking quality that would be attractive to the consuming public. A lead in the production of flours of this type was given when the flour known as "Canada Approved" was manufactured on a commercial scale in that Dominion in 1942, but in making this flour those concerned had given their whole attention to vitamin B_1, so far as nutrients were involved, and had disregarded other vitamins and the iron. Incidentally the extraction of this flour averages 78%.

DISTRIBUTION OF NUTRIENTS IN THE GRAIN

The first step was to dissect individual wheat grains to provide a series of representative fractions which could be submitted to microanalysis. The microanalysis largely fixes the speed of this work. Satisfactory micromethods are available for protein and iron, while a method has been developed for B_1 which can measure 0·01 i.u. with an accuracy of ± 3% (Hinton 1943). Riboflavine and nicotinic acid assays have, however, not yet been reduced to a micro scale, so reliance has to be placed on the analysis of carefully milled fractions.

Some of the results of this work have been published (Hinton 1943; Moran 1945): the more important findings are that the larger proportion (about 60%) of the vitamin B_1 of wheat is located in the scutellum fraction of the germ, whereas the nicotinic acid and iron are concentrated not strictly in the bran itself but in the outer endosperm adjoining the aleurone layer. The germ as a whole—both scutellum and embryo—contains appreciable quantities of riboflavine, nicotinic acid, and iron. This distribution is shown in fig. 1.

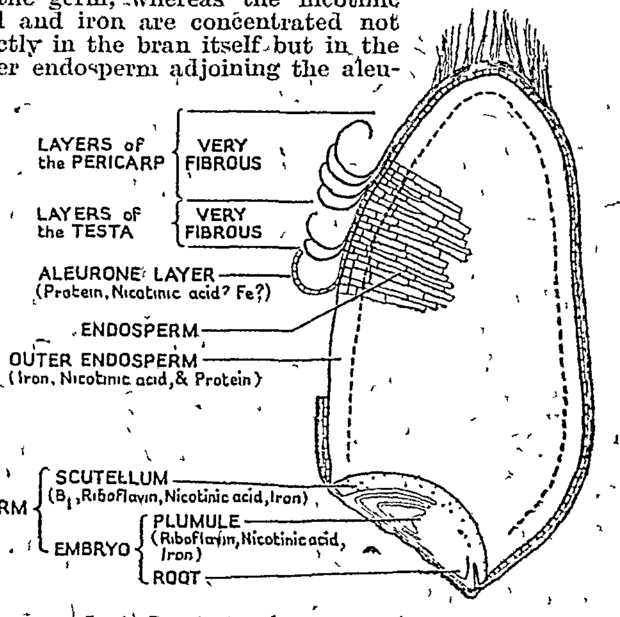
LAYERS of the PERICARP
VERY FIBROUS
LAYERS of the TESTA
VERY FIBROUS
ALEURONE LAYER
(Protein, Nicotinic acid? Fe?)
ENDOSPERM
OUTER ENDOSPERM
(Iron, Nicotinic acid, & Protein)
GERM
SCUTELLUM
(B_1, Riboflavin, Nicotinic acid, Iron)
EMBRYO
PLUMULE
(Riboflavin, Nicotinic acid, Iron)
ROOT

Fig. 1—Distribution of nutrients in wheat grain.

The actual concentration of any nutrient in germ or outer endosperm will depend primarily on the variety of the wheat but may also be influenced by conditions of cultivation and other factors. It is not easy to derive average figures but those given in table I may be taken as reasonable values for the four important nutrients which can be estimated with satisfactory accuracy. They represent fractions of a grist made up of English and Manitoba wheats in approximately equal amounts.

TABLE I—CONTENT OF VITAMIN B_1, RIBOFLAVINE, NICOTINIC ACID, AND IRON IN DIFFERENT PARTS OF THE WHEAT-GRAIN

Factor	Whole wheat	Clean bran including aleurone layer	Scutellum	Embryo	Outer endosperm (approx.)	Bulk endosperm (by difference) including outer endosperm
Vitamin B_1 (i.u./g.)	1·2	1 6	55	3	1·5	0·2
Riboflavine (µg./g.)	1·6	5	15	15	1·8	0·7
Nicotinic acid (µg/g.) ...	50	250	60	60	150	22
Iron (mg./100 g.)	3·5	12	9	9	10	2·1
Approx. % by wt.	100	12	1·5	1	3	85·5

The above figures are based on assays by E. C. Barton-Wright, R. G. Booth, and W. J. S. Pringle.

There are indications that the germ and outer endosperm are probably rich in other factors, and this is borne out by other analyses made in the Cereals Research Station and by the published figures presented in table II. In assessing the possible contributions of the different factors that can be made by endosperm and germ it must not be overlooked that the amount of endosperm in wheat is roughly 35 times that of the germ

TABLE II—CONTENT OF OTHER NUTRIENT FACTORS IN VARIOUS FLOURS (µG PER G)

Flour	Pyridoxine (as free base)[1]	Pantothenic acid[2]	Biotin[3]	p aminobenzoic acid[4]	Vitamin E[5]
Whole wheat	4·2	5·1	0·07	1·5	0·003
85% flour	1·8	3·0			
Patent flour	1·2	2·1	0·005		
[illegible]0% flour	3·1	4			
Germ	14·6	8		1·8	0·16
Bran	13·8	21·0	0·011		0·003

1 and 2 Barton Wright (unpublished) 3 Lampen et al 1942
4 Thompson et al 1943 5 Binnington and Andrews 1941

Many of the other constituents of wheat and flour, particularly the minerals, have been investigated in detail, together with the available calories provided by flours of different extractions; the findings will be published shortly (McCance et al 1945).

The endosperm is not uniform in composition; the concentration of the nutrients we are considering appears to increase from the centre towards the boundary adjoining the bran. Unfortunately, the different concentration gradients are not yet known but the evidence so far obtained suggests that they slope steeply as they approach the aleurone layer—hence in all probability the high average values for the outer endosperm. Protein is probably exceptional, since the work of Cobb (1905) suggests a more constant gradient. It is clear, therefore, that the contribution made by the endosperm to the nutrient content [illegible] ely on whence it is drawn and [illegible] of the outer endosperm is inclu[illegible] endosperm" in table I have been calculated by difference, and therefore represent the mean concentration in the *full* 85·5 parts of endosperm.

TABLE III—THEORETICALLY POSSIBLE LEVELS OF VITAMIN B_1, RIBOFLAVINE, NICOTINIC ACID, AND IRON IN FLOURS OF DECREASING EXTRACTION

Factor	Rate of extraction			
	100%	85%	82½%	80%
Vitamin B_1 (I.U./g)	1·2	1·20	1·23	1·26
Riboflavine (µg/g)	1·6	1·1	1·1	1·15
Nicotinic acid (µg/g)	50	23	23	23
Iron (mg/100 g)	3·50	2·30	2·30	2·32

It is of interest, using the figures in table I, to calculate the levels of the four nutrients, *theoretically possible*, in 85%, 82½%, and 80% extraction flours (table III). These three flours would contain the full 2·5 parts of germ, while the endosperm would include all that adjoining the aleurone layer. It is clear that on theoretical grounds the drop in extraction from 85% to 80% need not reduce the nutritional quality of flour.

PRACTICAL APPLICATION

Clearly, therefore, to obtain in practical milling a flour of good nutritive worth it is necessary to secure the passage into the flour of most of the germ, certainly all the scutellum, and as much as possible of the outer endosperm layers adjacent to the inner layers of the bran. To this end the Ministry of Food advised millers by the issue of a circular at the time the rate of extraction was reduced to 82½% from 85% that the first essential in milling such a flour is to include all the germ and particularly the scutellum, and that the second aim should be to 'clean' the bran as thoroughly as possible and include the "cleanings" in the finished flour. The report indicated how this could be done (Kent et al 1944). This advice applies, with even greater force, to the milling of a flour of 80% extraction.

How successful the millers were in producing a good flour of 82½% extraction during the three months that rate was in force can be seen from the figures in table IV. In this table are also given values for commercially produced flours of the current 80% extraction. The complete data on 80% flour will be presented shortly in the form of one of the Reports which have been published by the Ministry of Food (National Flour and Bread, 1942, 1943, 1944). Having regard to the fact that as the millers continue to study the technical problems involved the nutritive value of the flour will tend to improve, [illegible] average values will [illegible] mately the [illegible] in the right hand column of t[illegible] machinery will pro[illegible] and new [illegible]

TABLE IV—PRELIMINARY RESULTS OF ANALYSIS OF COMMERCIAL FLOURS *

Factor	Rate of extraction		
	85%	82½%	80
Vitamin B_1 (I.U./g)	0·98	0·88	0·80
Riboflavine (µg/g)	1·3	1·0	0·8
Nicotinic acid (µg/g)	17	18	16
Iron (mg/100 g)	2·07	1·94	1·65
Fibre (%)	0·50	0·31	0·21
Colour index	100	41	11

* No allowance is made for any added white flour (Canadian G.R.) but this does not affect the general picture and conclusion.

TABLE V—PROPORTIONS OF BRAN, GERM, AND ENDOSPERM IN FLOURS OF DIFFERENT EXTRACTION

Fraction	Rate of extraction			
	100%	85%	82½%	80%
Bran	12	3·4	2·0	1·4
Germ	2·5	1·9	1·7	1·6
Endosperm	85·5	79·7	78·8	77·0
	100	85	82·5	80

Wheat is a poor source of calcium. The present 80% flour is, however, enriched with calcium carbonate at the same level as 85% flour (7 oz. per 280 lb. of flour), so the total calcium content averages about 80 as against 83 mg./100 g. for 85% flour.

The colour index gives a rough measure of the colour of the flour (and the resulting bread). A colour index of 100 represents the average colour of 85% flour and

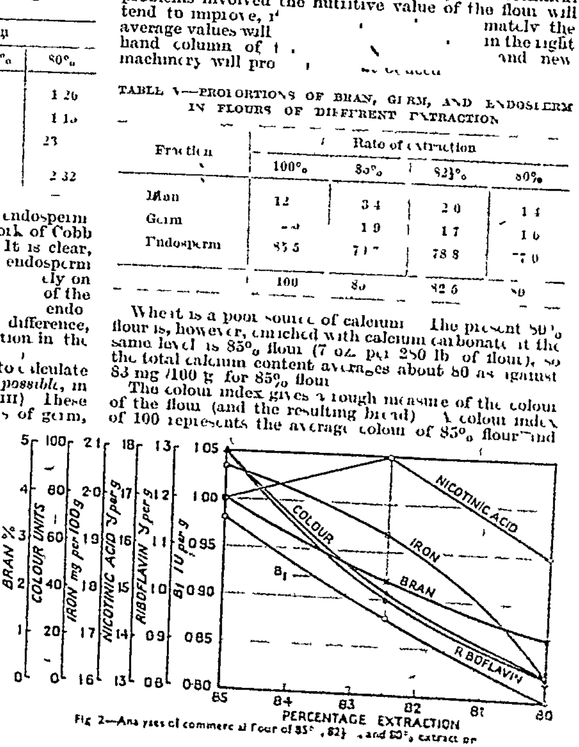

Fig 2—Analyses of commercial flour of 85%, 82½, and 80% extraction

0 the colour of pre-war white flour. A colour-index of 11 (the average for 80% flour) means that the colour of this flour is equivalent to that given by a mixture of 11 parts of 85% flour and 89 parts of pre-war white flour.

In terms of grain constituents, the flours are made up as in table v. The three flours (85, 82½, and 80%) contain approximately 76%, 68%, and 64% of the total germ in the wheat.

MILLING PROBLEMS

It will be noticed that the nutrient values for these flours (table IV) do not come up to the theoretical values given in table III. There are two reasons for this—first, the flours did not contain the full quantity of germ; and secondly, the rich outer endosperm layer was probably not wholly included, possibly because it was feared that its grey colour would adversely affect the colour of the final product.

If the miller aims at producing the palest-coloured 80% flour—and it must be recognised that competition to meet demand gives him that incentive—then he is inclined to keep the quota of bran "cleanings," which are of a brownish colour, to the minimum to avoid having to reject the equivalent amount of the whitest flour. It is unfortunately a fact that much of the scutellum and the outer endosperm are associated with a quantity of powdered bran, and this in fact defines the technical problem involved in the milling of high-vitamin white flours. Further, as the extraction is lowered, the miller, in order to get his length (extraction), can reject progressively more of the coloured stocks; thus in milling an 80% flour only 77·0 parts of endosperm are required as against 79·7 parts in the milling of 85% flour.

Fig. 2 shows the results listed in table IV graphically. The B_1 and riboflavine figures follow those for germ content shown in table v, while the iron figures reflect the increasing ease in obtaining the full extraction without the need for including some of the fractions undesirable from the point of view of colour as we pass from 85% to 80% flours. At the same time, they do not follow the bran contents of the three flours, suggesting that an appreciable amount of outer endosperm is present in 80% flour. This fact has recently received indirect confirmation in experiments carried out by Dr. S. K. Kon (private communication). He has found no significant difference between the biological values of the protein in 80% and 85% flours. The colour of the flour is in line with the fibre or bran figures, the improvement between 82½% and 80% being distinctly less than that between 85% and 82½%. The nicotinic acid figures show surprisingly little change.

As already noted, the figures for flour of any extraction will depend to a large extent on the type of wheat used, and even with one variety the crop may vary from year to year. For this reason, fig. 2 cannot be regarded as a set of constants. Again, the milling of flour to contain the germ and outer endosperm while at the same time producing a flour of good colour is a new development in milling with great scope for skill and invention. The flour produced by some millers is already superior to that represented by the average figures quoted in this paper. Thus, in the case of B_1, the following results for 80% flour were obtained for the samples from 143 mills examined in a recent week:

Vitamin B_1 (i.u./g.)*	1·0	0·9	0 85	0·80	0·70	0 60	0·50
% age of samples	0·7	14·0	31·5	51·1	82·6	95 9	100·0

* The figures given are all minimum values.

The same type of variation between mills was also found in the results on 85% and 82½% flours (National Flour and Bread 1944).

SUMMARY

Recent research has provided us with a clearer picture of how the different nutrients, including vitamin B_1, riboflavine, nicotinic acid, and iron, are distributed in the wheat grain. With this knowledge, it has been possible to develop new methods of milling which do not aim merely at a given extraction but instead are directed at including in the finished flour the more valuable fractions of the wheat which might otherwise be lost to th[illegible]ls. This is the basis of the present 80% flour. At the same time, with a flour of this extraction, it is possible to eliminate practically all of the bran and so give a loaf which is more acceptable to the bulk of the population.

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CONDITION OF LIBERATED COUNTRIES

Dr. Andrew Topping, director of the health division in the European office of Unrra, last week gave the press a reassuring account of conditions in France and Belgium, which have never been as bad, he said, as was supposed. Parts of Holland are in much worse case, and in Greece there are difficulties partly because medical practice is far behind the times. In Italy the people are not on the whole receiving a balanced diet, but are not much worse off now than they were before the war. Missions are ready to go to the countries under the control of Russia, but so far have not been able to gain permission to enter. Leave to send a team to Yugoslavia was obtained only with difficulty, but lately the Yugoslavs have asked for a plastic surgery team. In Dr. Topping's opinion Unrra's chief contribution so far has been to set up and maintain the large camps for refugees in the Middle East and North Africa, from which the occupants are now gradually being sent home.

Some 205 Unrra teams are at work among displaced persons in Europe, and their number is to be increased to 450. Each team includes a doctor and nurse, but in this country it has been possible to accept only doctors who are over age for service with the Forces, or physically unfit. Lately doctors and nurses have been recruited from France, Belgium, Poland, Czechoslovakia, Denmark, and Sweden; and there are good hopes that Switzerland will also contribute staff. Permission to send Austrian refugee doctors has recently been granted.

Colonel V. P. Sydenstricker said that in parts of Holland 10% of the people in poor districts had famine œdema, and adults had lost an average of 25–30 lb. in weight. The Dutch authorities have lists of those showing cachexia or œdema; public-health nurses have been visiting them, and they have been given extra food sent by the Swedish Red Cross. Dutch feeding teams, of which there are 27 already in action, have proved very useful, and with the summer and the harvest coming conditions should improve. Though feeding with protein hydrolysates has given good results in Holland it could not be used in Belsen and like places, because the inmates suspected that any injection was meant to kill them. Most people in the concentration camps, however, do well on milk and gruel.

Colonel R. E. Butler, speaking of the Unrra refugee-camps for Yugoslavs and Greeks, said that though many of the people were in a poor way when they came in, examination during the past eight months has shown only a few minor deficiencies among them; all the children are in good shape. In Greece in 1940–41 the situation was serious and there were many deaths from starvation; but there is now little extreme malnutrition. The growth of the black market, designed to discomfit the Germans, and the arrival of Swedish Red Cross parcels, made the difference. In Italy, again, there are some minor deficiencies but no famine œdema and no serious disturbances of age-height-weight figures among children. He pointed out that the official ration is no indication of the quantity of food eaten. In Italy official rations amount to 850 calories in the south and 750 round Rome; but unrationed foods increase this figure greatly. In Belgium a ration of 900 calories is about doubled by unrationed and black-market foods.

Dr. R. L. COIGNY said that Sweden is sending more than 200 mobile teams to repatriate displaced persons. This work is being done rapidly; in France half a million have come home in 25 days, many by air. Repatriates are disinfested once before leaving for home and again on arrival, and this should prevent typhus epidemics—though, as Dr. NEVILLE GOODMAN pointed out, where movement of large numbers is so rapid, one or two infected or infested people will be liable to slip through.

Prof. R. R. STRUTHERS noted that some of the difficulties in Holland derive from lack of coal and soap, which makes it difficult to sterilise babies' bottles and to wash their clothes. The children, he said, are comparatively well, but lean. There is serious shortage of food and milk in the south of France, unnecessarily aggravated by prejudice against dried milk.

Colonel R. S. GASS had found no truth in the report that one Italian child in five has tuberculosis. In fact, the increase in the Italian death-rate from tuberculosis is no greater than our own.

GENERAL MEDICAL COUNCIL

PRESIDENT'S ADDRESS

ON Tuesday Sir HERBERT EASON, the president, opened the 164th session. Since the council last met before the war their membership has altered, he said, to an unusual extent. Of the 39 members at the outbreak of war, only 16 are left; 11 have died, and 13 have resigned. "Death no man can prevent. But from the point of view of the council's
their personnel do not
of their business." It
council if the licensing bodies would, in making appointments, choose and maintain representatives who could sit for a fairly long period.

The President then spoke of members and former members who have lately died.

as a translator for the English mind of the minds of our neighbours across St. George's Channel he was incomparable." Mr. A. W. Sheen, whose contributions were always characterised by complete independence of thought, "brought to our counsels the same genuine enthusiasm with which he nurtured the Welsh National School of Medicine"
University of Leeds,
in 1942 became insp
surgery. In the last stages of his illness he forced himself to inspect the examinations of Cambridge and Oxford; but "time was not given to him to prepare his general report on the inspection which he just lived to complete, and by his death we have been deprived of the advantage of his mature judgment on the qualifying examinations in surgery as a whole."

Of the three retiring members Mr. Bishop Harman was elected as a direct representative in 1920, and his long service was of great value, "not only from his intimate connexion with the British Medical Association, and his knowledge of the views of the profession

the University of St. Andrews on his appointment to the chair of pathology at Glasgow; "we had hoped for much further service from him as a comparatively young member of the council." Dr. John Ritchie, Crown nominee for Scotland since 1935, was chairman of the public health committee from 1939, and "of his services to the council both on that committee and in their general deliberations I cannot speak too highly."

The four members joining since the November session are Prof. Henry Cohen, a Crown nominee; Prof. W. J. Tulloch, of St. Andrews; Prof. J. M. O'Connor, of University College, Dublin; and Dr. Andrew Davidson, chief medical officer of the Department of Health for Scotland.

THE CURRICULUM

"Progress has been made," said the President, "with the revision of the curriculum, which so far as the council are concerned means the revision of their recommendations to licensing bodies, first, as to the education in general and in preliminary scientific subjects of persons desirous of entering the profession; secondly, as to professional education; and thirdly, as to professional examinations. The four special committees appointed by the council to report to the standing committees on education and examinations on the revision have all met, and have probably carried their work as far as is practicable until observations by or on behalf of all the bodies are before them. A majority of the bodies,
een
ary
to
organisation
normally requires them to follow in settling their views on a matter which should not be too hastily dealt with. I think it is already clear that, except perhaps in the field of social medicine and public health, the council's task in the revision of the recommendations may be

qualified, but are educated both in the general and in the professional sense, must always fall to the authorities of the bodies and of the medical schools, to the teachers, and to the examiners."

THE REGISTER

"The number of practitioners on the Medical Register at the end of 1944 was 73,616, an increase of 1764 over the number at the end of 1943. The total number includes 6124 practitioners registered in the normal course, and 767 registered temporarily under Defence Regulation 32B, by virtue of qualifications granted in the British Empire outside the United Kingdom and Eire; and 603 practitioners registered in the normal course, and 3169 registered temporarily, as foreign practitioners.

practitioners temporarily
, in the language of 1886,
are serving in the Armed
y regis-
between
where they qualified and the United Kingdom.

"Of the foreign practitioners whose registration is temporary, many, and among them the first to be so registered, qualified in the United States of America, and they are for the most part engaged in military service. But the majority are graduates of universities in European countries which have never seen fit to enter into reciprocal relations with the United Kingdom. We recognise, I am sure, the value of the services which these practitioners have rendered to the civil population here since the expansion of the Armed Forces absorbed an increasing proportion of the practitioners of the United Kingdom. No doubt, however, as soon as some measure of order has been established in Central Europe, it will be agreed that their own territories have the first claim upon them for assistance in the urgent task of restoring an efficient public and personal medical service for the benefit of their fellow countrymen."

THE Central Council for Health Education now has "a balanced team of technical officers whose services are available to local authorities, educational institutions, and voluntary organisations for help in their health education work." This team consists of medical men and women with specialised experience, two biologist educationists, and an educational psychologist. Further information may be had from Dr. Robert Sutherland, medical adviser and secretary of the council, at Tavistock House, Tavistock Square, London, WC1.

In England Now

A Running Commentary by Peripatetic Correspondents

FIRST-HAND reports of conditions in Germany continue to be somewhat terrifying. Just before the surrender, near the Czech frontier, a French and an American division followed the track for sixty miles of a column evacuated by the Germans from a political camp. Sixty miles of bodies by the roadside, sixty miles of ghosts, living corpses, tottering out of the woods and barns or waving feebly at the passing cars.

The debt is being paid, at least in part, by some of the Displaced Persons, and unhappily their revenge involves the wastage of stores needed by the whole world, including the displaced persons themselves. Blankets are stolen off the beds of patients in hospitals, yet a store of thousands of blankets was set on fire. Every bit of furniture in a milk-bar for children started by an UNRRA welfare officer was stolen the first day, and nothing can be left unguarded for a moment. Human life seems to be held in contempt by the Russians, and doctors have to treat appalling knife and grenade wounds resulting from trivial quarrels. They are even said to play catch with grenades with the pin out, the last man to hold the grenade before it bursts being literally "out." Yet a good leader who will organise singing and physical games can easily keep them in hand.

The conditions under which displaced persons have been living vary enormously. Families in a garden city near Frankfort were living a happy, nearly normal, family life. In the same area a collection of 23 nationalities showed the uttermost depths of human squalor and degradation. The French have already repatriated half a million of their people and reckon there are another half million to come and half a million dead. There are exceptions, however. A French official in Germany met a hooded, two-wheeled cart drawn by two women. Inside was a Frenchman who spurned the suggestion of coming to the nearest assembly centre for repatriation. "I live the life of a lord," he said. "During the day these two Russian women pull me over the countryside. If I am hungry or thirsty I ask for food and drink at a farm and I always get it. At night I have a little tent to sleep in and the Russians sleep on the ground outside to guard me. Repatriation! Je m'en fous!"

Footnotes:

1. Fifty-five Nazis or their agents were found (I am told) in one Paris-to-Brussels trainload of repatriates.
2. The difference in the transport difficulties between Paris and Brussels is that on the Brussels trains you say, "Pardon!" and shove, while on the Paris metro you just shove.
3. German Major to British RECCE Subaltern after surrender: "Pretty difficult situation all round, what, old boy?" British Subaltern: "It may be difficult for *you*, but it's not in the least difficult for me."

* * *

The sun shone down on us, the lamb bleated, and the press of children with their next-of-kin inside the gates was only exceeded in density by the solid crust of children wedged enviously against the locked turnstile. Somebody passed Mr. Handley another animal. He had already welcomed a fox-cub ("I've brought this for you, sir," Mrs. Mop murmured lovingly), a horrified gosling, and the lamb. At our feet a dingo pup was capably tearing his way through the sacking roof of his box, and Donald Duck, detained in a basket, was giving a gala demonstration of temper. We were among the privileged guests at the reopening of the Children's Zoo—one of the first and best of peace-time pleasures to come back to us; and there were Mr. Handley, and Mrs. Mop, and Sam, and So-So, and the Colonel and all the other looking-glass creatures of ITMA, as large as lions and nearly as natural, in our very midst.

"Why does he have to be in a box?" asked David, watching the tireless dingo. In a sun-suit decolleté to the waist and terminating unexpectedly in long blue linen trousers, David looked his age—rising four. "It's a surprise for Mr. Handley," replied his grandmother, who *looked* considerably less than hers. "Why does Mr. Handley have to have a surprise?" David wanted to know: and Mr. Handley, who had just been supplied [illegible]eet, looked as though he would be glad to know too. The bird was white with a sky-blue tongue, a beak fit to chisel concrete, and prominent cynical eyes lidded and encircled with blue shagreen. He sat on Mr. Handley's shoulder and seemed to be considering whether to take an ear or an eye for luncheon. Fortunately he was vegetarian. So was the half-grown kid who came next, and devoured the Handley buttonhole ("What a showman, eh?" So-So exclaimed admiringly.) But at last the animals ran out, and Mr. Handley having declared the Children's Zoo open ("Did you say they were open, sir?" asked the Colonel), stepped down from his trial a free man, without a stain on his character, and we all went off to see the Mouse Town. Mice live in Shakespeare's England, except for the cinema; and judging by the tails sticking out of the front doors, the houses are overcrowded within the meaning of the Act. The dreadful congestion in the entrance to the cinema was due, I was told, to a popular programme—yes, an early Disney, naturally. Then there were rabbits and guineapigs, chickens and ducks, a timely brood of new goslings haunting a pool beside a windmill, and a llama weaving through the crowd with the unpredictable expression of Harpo Marx on his face. It was a splendid party, and the Zoo authorities who thought of it must have felt, as we did, that only one thing could have made it better—a children's zoo made like a concertina or a Revelation suitcase, which could have stretched to take in all those famished onlookers at the gate. But they will get in all right next time.

* * *

I was watching an anæsthetist at work the other day. He was giving "closed" cyclopropane with the plethora of tubes and dials which is the fashion nowadays. Soon after the start of the operation he uncoupled the rubber hose from the patient, put it between his own lips, and took several sizeable breaths. He then returned it to the patient. Neither the patient nor the anæsthetist was visibly affected by this episode, and I did not see it repeated. At the end of the operation I asked the anæsthetist to explain the ritual. He said that the signs of cyclopropane anæsthesia were sometimes not very obvious, and that he did this in order to estimate the concentration of gas which was being inhaled, since no more reliable method had yet been invented. But if the gas affected the patient so profoundly that his peritoneum could be laid open without protest, I inquired, why didn't it affect the anæsthetist. "Oh, but it did": he assured me, "for a few seconds I was dizzy and hallucinated, and barely aware of my surroundings." I was about to remark that it was high time a less hazardous method of estimation was evolved, but he launched an eloquent dissertation on the effects of anæsthesia on the phenomena of consciousness, while nonchalantly engaged in abolishing those of the next patient. "The first to go," he said, "are the powers of reasoning and *logical* thought, and in consequence the flow of ideas at this stage is preternaturally rapid, and often disordered. The subtle orchestration of sensory perception is next attacked, so that unnoticed background noises, such as the hissing of a steriliser, spring into prominence; and unadmitted resemblances, such as that between the surgeon and a gargoyle, become surrealistically clear. This phase, if not too mirth-provoking, leads into one of reverie and abstraction, and that in turn to unawareness of the surroundings and profound confusion. There is yet no disequilibrium or incoordination, and in fact the subject will still appear perfectly normal to the observer, although the whole fabric of his conscious mind is tumbling about his inner ears. It is a remarkable fact" he went on, "that the conscious mind can be reduced to chaos by an anæsthetic concentration which is unable even to modify the more robust reactions of which we think so little. What a flimsy tissue-paper crown it is which distinguishes us from the animals!—the power to communicate ideas and to contemplate ideals: to be enchanted by a symphony and disgusted by a sound: to be uplifted by a passion and dejected by a doubt; to be divided by a schism and united by an 'ism'; all this elaborate castle in the air can be blown to shreds by a puff of cyclopropane, and the Machiavelli and the simpleton can be reduced alike to the level of the ox. Men are equal before the Anæsthetist as they are equal before God," he concluded, and it was only then that I realised he had been at it again.

Letters to the Editor

A COMPREHENSIVE MEDICAL SERVICE BY NEXT JANUARY?

SIR,—In putting forward my compromise plan for
medical service by Jan. 1.
of May 19, p. 635), I had
of the situation as between
the medical profession, hospital authorities, local-government authorities and the Government. But I had also in view the possibility, if not the probability, that political indecision would prevent a beginning being made before an election. The political decision to hold a General Election in July justifies my fears.

Whatever may be the political complexion of the new Government, it will have before it its own programme of immediate urgency. What I still fear is the postponement of the coming into operation of the National Health Service to a date later than originally contemplated—for instance, after the defeat of Japan.

My suggestion of using the EMS organisation in the regions into which Great Britain was divided for war purposes—one of which regions is, of course, Scotland as a whole—was based on the fact that this organisation was (1) of a temporary character, and (2) medically speaking had worked very well.

Part reason for the working of the EMS hospital scheme being so good is that it secures the cooperation—usually intimate cooperation—of voluntary and publicly owned hospitals in each region under the general supervision of the principal medical officer of the region. To continue this hospital service, and that of consultants, specialist advisers, and special services that go with it, as the compromise arrangement for providing necessary services under the National Health Service, would help and not hinder a final settlement, and it could be inaugurated by Jan. 1, 1946.

It is certainly not easy under any circumstances to arrange for a 100% domiciliary service at the present time. And to put the duty of seeing that this service was provided on the shoulders of the regional organisation of the EMS for each region puts a new duty upon the EMS. But it will not be easy to provide a 100% domiciliary treatment in any case, and in the beginning the service may not be complete under whatever auspices it is inaugurated. My proposal to charge the EMS with this duty would involve them in surveying the field of private medical practice and offering appointments on a temporary basis to provide for the essential needs of medically depleted areas. They would do this in cooperation with the Central Medical War Committee.

There are very many difficulties in carrying out any scheme of National Health Service at the present time and I claim only for my proposal that it would get things done quickly and that it would be temporary in its application. It would in this way bridge the gap

for a job. Without this bypass arrangement, as I have called it, this interim period may pile up practical, administrative, and political difficulties which will make the inauguration of a National Health Service very much harder than it need be. And unless we arrive at a working compromise, the date of the inauguration may be much postponed.

House of Commons. L. HADEN GUEST.

THE MEDICAL SUPERINTENDENT

SIR,—I expect that most of the hospitals in the country will be taking a part in some form of State health service within the next few years. They will probably, therefore, come to adopt a fairly uniform system of administration. I wrote my letter of April 21 because I believe it would be a mistake to appoint, as standard practice, medically qualified superintendents as defined by Mr. Somerville Hastings. His experience of these officers is very great; in fact there is probably no-one else with so many under his administration. Hence we may accept his opinion that a good clinician is rarely a good administrator. This must mean that the two attributes are rarely combined in the same individual. While freely admitting that there are notable exceptions to the rule, it cannot be wise to apply universally a system which demands such a combination.

I do not foresee the continuation of flag-days, appeals, and advertisement in aid of individual hospitals. The house-governor of the future should be free to apply himself to administration without these harassing distractions. If, as I advocate, he has had a long, special training followed by experience in junior administrative posts on hospital staffs he will have acquired ample medical knowledge to suffice for his routine work by the time he reaches senior rank in his profession.

I do not recommend that the chairman of the hospital should preferably be a medical man.

W. A. LISTER.

PULMONARY EMBOLISM IN LIBERATED PRISONERS-OF-WAR

SIR,—Between May 1 and May 9 about 300 men were
S Hospital suffering from
oners-of-war in Germany.

In only 2 of them was the state of malnutrition severe enough to cause anxiety, but it was noticed during the first week that the majority were running a temperature. On May 9 one of the patients died in five minutes of pulmonary embolism, confirmed post mortem; he had been allowed up for a day or two, but had been put to bed again because of recurrence of œdema on the legs. Nine days after admission another man died of pulmonary embolism six hours after the first manifestation. The question arises whether some of the symptoms and signs noted in the other men were not also due to pulmonary embolism. Most of them had marched 500–1000 miles between January and May on very short rations. During the last month of the march almost all of these developed diarrhœa and swelling of the legs. The œdema was usually limited to the lower shin but sometimes extended above the knee, and in some cases it was asymmetrical. Among the symptoms which they developed were paroxysmal dyspnœa while at rest, chest oppression or pain, palpitation, cough (with blood-spitting in at least one case), and sudden collapse; and the diagnoses made by medical officers examining the prisoners after liberation included pleural effusion, bronchitis, bronchopneumonia, lobar pneumonia, and pulmonary tuberculosis. There were cases of sudden
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hours,"
the chest on
ad
attributed at first to unresolved pneumonia or atypical pneumonia, but we now suspect that at least a proportion of them were the results of pulmonary infarction, while some of the other
cyanosis of
sed by small,

Paul White, who believes that pulmonary embolism commonly goes unrecognised, states that its outstanding cause is thrombosis of the leg veins, beginning as a rule in the calf and extending into the long saphenous and femoral veins. Such thrombosis would explain the œdema developing in so many of these prisoners as their malnutrition increased. (This œdema is less readily attributable to hypoproteinæmia, for it was absent in a case where the plasma protein was 2·2 g. per 100 c.cm. but present in cases with readings of 6·0 g. upwards.) In the two patients dying of pulmonary embolism the iliac and femoral veins were found normal, but unfortunately the deep calf veins were not examined.

The increase of pulmonary embolism after the end of 1914–18 was attributed by Burwinkle [illegible]. If, as our experience suggests, there [illegible] of pulmonary embolism in men and [illegible] severe privations, it is very nec[illegible] after them should have this risk in [illegible] of their minds. My desire to make our [illegible] known at once has increased on hearing of cases in which [illegible] suggestive of pulmonary [illegible] returned prisoners-of-war [illegible] days' leave.

H. L.

A PARENT AT HOSPITAL

SIR,—Let me state that I have no connexion with the incident Countess Russell relates save as a reader of her letter in your issue of May 19.

I feel perturbed at the credence which her story has obtained. Surely, it is an axiom that, in any complaint, the defendant's version of an incident is as least as likely to be correct as that of the complainant. Yet the Countess has made grave specific charges which are tacitly accepted at their face value by the medical and lay press. Surely corroboration is required before even the facts of her story are accepted, much less the colouring in which she paints them.

I am immediately struck by the strong political flavour of the letter. Can it be solely coincidence that it has been published when the Socialist Party is endeavouring to socialise medicine and discredit voluntary hospitals? Are the Countess and her husband Socialists?

A number of interesting discrepancies in the letter are immediately obvious. The Countess refers to "a recent experience of my own" and yet later discloses that the following day was June 5. Thus, the incident occurred nearly a year ago. Why should such a complaint be stifled for nearly a year? Considering the lapse of time, the Countess's memory seems remarkably acute for every detail.

Can it be believed that a mother was left alone for 12 hours to nurse a child brought into hospital as an emergency, and that no nurse was present or came to take its temperature, change its clothing, attend to its natural functions, make its bed? Was no temperature chart kept, nor even a record of the patient's name and that of its parents, nor any record attempted of the fact that it was a new patient admitted to the hospital? Surely absolutely the most immediate automatic routine duty in any hospital is to record fully all the details of a new admission, the parent's name and address. It would need very trustworthy evidence before I could believe that this was not done. Yet one of the most serious allegations is that the attitude towards her changed when, on the next day, her name was first known when she came to inquire about his progress.

She also says that she is "disquieted" because her treatment at the beginning was that provided "for the poorest of the population." But I am quite sure that the Countess "with the habits of a class accustomed to nursing-homes," could not be mistaken for anything other than an aristocrat, or autocrat, especially when she ordered, and then administered, drugs.

In addition, she says she removed the child from the hospital the next day, which is scarcely proper treatment for a child with pneumonia and a temperature of 104° F, especially as she says she was then receiving "the utmost cordiality and consideration."

The Countess's memory is very acute for incidents which occurred nearly a year ago, but though the memory of the hospital staff may perhaps not be absolutely so well preserved and well prepared, I feel sure that the story they could tell would be very different indeed.

The Corbett Hospital, Stourbridge. THEODORE BLISS.

SIR,—Countess Russell's letter makes grave allegations against the doctors and nursing staff of a hospital in which her son aged 7 was nursed. No names are mentioned and the reader is asked to accept the account as true.

But there are certain points which are far from clear. The reader must assume that it was during the night that the child became alarmingly ill. Apparently the child was not ill on the previous day; otherwise, considering her concern for the tired and overworked medical profession, the mother would not have sent for a doctor at night. Even at this very early stage of the illness she thought the boy might be suffering from pneumonia. I gather he was removed to the hospital on the next day. As she had made up her mind that this was a case of pneumonia, she told the doctor that she had tablets of sulphadiazine, and the doctor instructed her to treat the case as pneumonia and told her the initial dose. One is led to believe that when the child was removed to hospital the nursing staff did everything in their power to refuse treatment. The hot-water bottle was removed, and no drink giv[illegible] this very ill child. As we are told that the child had a temperature of 104° F in the middle of the night it is unlikely that it was normal when he was in hospital. Presumably the practitioner had 'phoned the hospital asking if they had a bed for this child. Surely in speaking to the matron or sister on duty (we are told by you that it was a cottage hospital) the practitioner had told them that this was a case of suspected pneumonia?

After the doctors had examined the child they told the mother that he might be suffering from some "filthy germ" brought back from America. Indeed they told the mother that they suspected meningitis. Then Lady Russell asked "what about the rusty sputum?" Nothing of this kind had been reported to the doctors. Most obligingly the child produced a specimen. May I note that it is most difficult to obtain such a specimen from a child of that age? They mostly swallow it. But we are dealing with an exceptional child.

Again we are told that one of the nurses threatened to smack the child, and removed the teddy-bear as a punishment. This very ill child suffering from pneumonia and with a high temperature was able to give a coherent account of all this brutal treatment. It certainly strains one's credulity.

I gather that all this took place nearly 12 months ago? Why wait all this time before ventilating these grievous complaints? It makes one wonder if there is not some other motive behind this story.

I wonder too whether THE LANCET would have taken so much notice of this letter and have devoted so much space to it had it been signed by plain "Maria Hopkins." Your own observations cover as much space as the letter. You appear to accept it as a complete and accurate statement of fact. You further state that the experience of Countess Russell is not unique and you imply that it is not uncommon. You make a half-hearted defence of the present hospital system. You excuse this piece of gross negligence by such words as war, fatigue, tiredness, and overwork. The power of the press is very great: for THE LANCET to recognise this case is sufficient for the press of the land, particularly the more sensational type, to report the letter and your comments at some length. I trust the doctors and hospital concerned may have something to say about the case and permit the profession to have more accurate details. I make these comments since it is such a case as might have been my misfortune to attend as an ordinary general practitioner.

Herne Bay. MALCOLM FOSTER.

SIR,—The hospital which was the scene of the train of incidents described in Lady Russell's letter is referred to both by her and in your leading article as a "cottage" hospital. For two reasons this description must be incorrect: (1) the practitioner who advised admission did not attend the patient in hospital, and (2) mention is made of a house-physician. The misdescription is most unfortunate because it is precisely in its attitude to its patients and their relatives that the chief claim of the true general-practitioner or cottage hospital to a continued place in the medical service and in the affection of the population which it serves lies. We may not be as efficient as the larger hospitals in the treatment of the disease, but we do know how to treat the patient.

Moreton District Hospital. CLARK NICHOLSON.

SIR,—The Countess Russell deserves the thanks of the public for her letter. The story is familiar to anyone who has any interest in the nursing profession, and the state of affairs disclosed seems to be typical of the majority of the voluntary hospitals in this country.

The effect of the Rushcliffe report has if anything made things worse. In order to provide the off-time specified, the nurses are even more overdriven than before; the sisters are even more irritable, and have less time to train and instruct. Indeed, the only instruction the sisters have time for is how to scramble through the work. Even so, nurses do not get off duty punctually. Half an hour is considered long enough for the midday meal. Lordly articles in *The Lancet* on how to avoid cross-infections and how to protect infants from mortal infections while in hospital are merely rather bad jokes under present conditions.

I happen to be the husband of a former hospital sister and the parent of a daughter training at a big voluntary hospital, so I speak with knowledge.

Under the present conditions of scramble, how can the right type of nurse find any pleasure or satisfaction in her work?

I [illegible]

[illegible] is fully adequate. At present, so long as there are empty beds, patients are admitted, many of them suffering from illnesses which could perfectly well be nursed at home. It is clearly in the public interest that fewer patients should be well nursed rather than that a greater number be badly nursed. The result of this reform in the admission system would be that, after a time-lag of a few years, more nurses of the right type would enter the profession and stay in it, instead of giving up so arduous and thankless a job.

There should, of course, be machinery for the ventilation and redress of grievances. Also, it might not be a bad thing if the honorary staff took some interest in these poor helots of medicine.

MB CANTAB.

*** Lady Russell points out that we misread her letter in one particular: she never asked, or hoped, to be allowed to stay with her child overnight. He was actually in hospital for only one night, not two as we implied, and during that night she left him to the care of the staff.—ED. L.

THE GOODENOUGH REPORT

SIR,—Your correspondents in your issue of May [illegible] report for the foundation [illegible] al school (at Oxford) to train [illegible] consultants rather than g[illegible], as the signatories show, would create two categories of medical students, separation being made at a stage of preparation when it is quite impossible to foretell to which category the individual student should be assigned.

I submit that the findings of the Goodenough Committee must be interpreted by considering its origin. It was appointed in March, 1942, by the then Minister of Health, Mr. Ernest Brown. Its reference amounted to an instruction that the committee was to consider medical education on the assumption that the Government's policy regarding future medical practice as sketched by the Minister in the House of Commons on Oct. [illegible] February, 1944, while the committee was still in session). The most essential need created by the white-paper proposals is for a greatly increased number of general practitioners, a conservative estimate being that this number should be trebled. To meet this position the training of the general practitioner was reduced by the committee to 1½ years as against the 10 years laid down for the consultant. These circumstances, I submit, are a sufficient explanation of the separation of these two categories.

It should be remembered that at the date of the appointment of the committee Government departments had been enjoying for several years a wholly unaccustomed measure of authoritarian rule under the emergency legislation so hastily passed at the beginning of the war. Thus under article 51b and 58a of emergency regulations the Minister of Health was empowered to "direct" civilian doctors to localities and tasks not of their own choosing, as exemplified in an answer to me (*Hansard*, Sept. 21, 1943, col. 10). This power of "direction" to be continued after the war was explicitly retained by the Minister of Health in his opening speech (*Hansard*, March 16, 1944). But an even more serious example of this authoritarian trend is furnished by a more recent pronouncement which has received curiously little notice in the medical press. In an answer to me (*Hansard*, Feb. 13, 1945) the Chancellor of the Exchequer very courteously expounded his financial intentions for the universities in advance of his Budget speech. For the first time there was to be a subsidy in respect of medical education separately from the larger subsidy assigned to the general purposes of the universities. On Jan. 18, 1945, the Minister of Health had made the following statement:

> "The Government have decided, as recommended by the (Goodenough) Committee, that future payments of grant to medical schools should be conditional on the adoption by the school of the principle of admitting a reasonable proportion of students of both sexes."
>
> "The Government attach equal importance to the revision of the medical curriculum, and their acceptance of the principle of increased grants for medical education and research is dependent on the early completion of this process."

This is obviously a serious [illegible] pendence of universities in [illegible] not within the province of a [illegible] The recommendations of t[illegible] have never been considered by Parliament, and they possess no authority other than that of a departmental committee appointed by a Minister whose occupation of his office was terminated abruptly not many months after the setting up of the committee.

There are not wanting symptoms of revolt, of which I have intimate personal knowledge, in important committees within the University of London. I suggest that this example should be followed by other universities, who should offer a united protest against the assumption—unprecedented as it is—of authority exercised by the Cabinet, without reference to Parliament, to impose financial sanctions enforcing educational policy.

House of Commons. E. GRAHAM-LITTLE.

EFFECTS OF SULPHONAMIDES ON BONE PHOSPHATASE

SIR,—Silver and Golding, in their article of April 28, have criticised a communication made by us a short time previously (*Nature, Lond.* 1945, **155**, 203). While we believe their discovery of the behaviour of sulphonamides and *para*-aminobenzoic acid towards phosphatase to be of great importance and hold that they demonstrated this in a most convincing manner, we consider that their criticisms and conclusions call for the following comments.

(1) Our results were presented as "a preliminary report" in the form of a letter to *Nature*. We did not give such details as blood-sulphonamide levels, although we do possess data of this nature.

(2) We did not exclude the possibility of a carbonic anhydrase inhibition by sulphanilamide, but we stated that this may have occurred along with phosphatase inhibition. With sulphapyridine, carbonic anhydrase inhibition is, of course, excluded in view of the work of Keilin and Mann (*Ibid*, 1941, **146**, 164).

(3) W[illegible] imental [illegible] r about [illegible] sulphapyridine inhibit bone phosphatase in vitro," which is borne out by fig. 1 in their paper, even though the effect of sulphapyridine on phosphatase is small. It is also noteworthy that the concentration of sulphapyridine they used to study histochemically the effect of this substance on phosphatase was much lower than the concentration of sulphanilamide used in comparable experiments.

(4) As to their main criticism—that they did not notice any measurable effect of sulphanilamide and sulphapyridine on phosphatase in vitro at the levels used in our experiments—we ourselves mentioned this in our communication, as follows: ". . . whereas the dosage used in our experiments was about seven times the therapeutic one, the resulting blood levels would, however, be still very much lower than the concentration used by Golding and Silver to demonstrate gross phosphatase inhibition in vitro." Incidentally, these workers seem to have overlooked an error in the description of their graphs, mg/100 c.cm. being described as mg/c.cm.

We are of the opinion that it is not permissible to apply in-vitro results, like those of Silver and Golding, directly to observations made in vivo, especially since these workers admit that "the concentration of phosphatase in the body is unknown" and that the concentration of phosphatase did not influence the degree of inhibition over the *limited* range studied. In vivo such factors as the rate of deposition of bone substance, the local concentration of both phosphatase and sulphonamides in and around the cells, and many other things are bound to play a part that cannot be judged from in-vitro work.

Even if it were permissible to apply quantitatively in-vitro results to in-vivo observations, it does not follow that even a very small reduction in phosphatase activity could not have caused the effects observed by us. Deposition of bone salt only occurs when the solubility product is exceeded locally. Therefore the slightest reduction in one of the ions may suffice to reduce the ionic product below this critical value and thus inhibit to a large extent the process of calcification.

Finally we would like to stress that we stated no conclusions in our letter, but only put forward certain hypothetical interpretations based on the evidence available to us and intended to stimulate further lines of work.

R. BENESCH.
M. R. A. CHANCE.
London. L. E. GLYNN.

*** In the article of April 28, the authors should appear as P. H. Silver, MRCS, and J. S. R. Golding, MB CAMB., and the description "Students in the Department ..." should be deleted.—ED.L.

RETURN TO CIVIL LIFE

SIR,—I fear that in your interesting leading article of May 19 you quote inaccurately from a paper of mine on rehabilitation and resettlement in psychiatry. You give the impression that all my cases were ex-Service patients, whereas only 28 were. Other figures which you quote are inexact and give too hopeful a view of the results in psychiatric cases. However, I do not wish to occupy your space discussing these figures as the total number of ex-Service patients in that series was so small.

I would rather illustrate the difficulties of resettlement of ex-Service patients suffering from psychiatric conditions by quoting from another series (Stalker. *J. ment. Sci.* 1944, 90, 727). The 130 ex-Service patients studied were a selected group in that they were all so severely affected as to require treatment at a psychiatric hospital after discharge from the Forces; many had been seriously predisposed before their service, which often had had little to do with their illnessses. Of these 130 patients, 56 had more than six months' unfitness for work after discharge.

Jordanburn Nerve Hospital and Psychological Institute, Edinburgh 10. HARRY STALKER.

EXPERIMENTAL NEPHROSCLEROSIS

SIR,—The illustrations of "nephrosclerosis" induced in the rat by treatment with desoxycorticosterone acetate (Selye et al. March 10, p. 301) show, as the authors admit, "numerous distended tubules, some filled with hyaline casts." In both of the large fields depicted the authors can point to only one single fibrosed glomerulus; interstitial fibrosis, tubular atrophy and collapse, and arterial changes are not evident. I have not had the opportunity of reading earlier accounts of the lesion by Dr. Selye and his colleagues. In the preamble they appear to consider the experimental lesion equivalent to the renal lesion in human essential hypertension. Though in the latter condition renal sclerosis may only be microscopic it is of a different order from their experimental lesion. Fibrotic glomeruli are associated with tubular collapse, atrophy, and interstitial fibrosis. Dilated tubules are only found in grossly contracted kidneys associated with groups of undamaged nephrons; they do not contain hyaline casts. This does not correspond with the illustration.

After experimental damage using a variety of agents (uric acid, oxalates, uranium) renal tubules show remarkable powers of regeneration, and a severely damaged kidney can return to normal, though dilated tubules lined by a flattened epithelium may persist for some time. The late Prof. J. Shaw Dunn demonstrated to me that, where damage was severe and long continued or repeated, the healed kidney sometimes showed cystic tubules with either a flattened or no epithelium associated with glomerular fibrosis up to total obliteration. In man this is sometimes seen after the renal damage associated with chloride loss from excessive vomiting.

Selye et al. state that "extensive studies concerning the biochemical changes induced by desoxycortone overdosage in animals revealed striking disturbances in the electrolyte [illegible] well-marked rise in [illegible]ride ratio." The giv[illegible] restored the Na/Cl ratio towards the normal and at the same time prevented the experimental nephrosclerosis in the rat. The maintenance of "striking disturbances in the electrolyte metabolism" is the modus operandi of renal-tubular damage in excessive vomiting in man and possibly also of experimental phosphate, oxalate, and uric acid nephritis in animals. Accordingly both the morbid anatomy and the chemical basis of Selye's experiments suggest that the primary renal lesion is tubular and is not related to the renal lesions of hypertension in man.

India. NORMAN MCLETCHIE.

DISCHARGED FROM HOSPITAL

SIR,—Your leading article of May 12 is most opportune. I have no knowledge of hospital accommodation in rural areas other than that in which I practise. But there is a great need to develop peripheral hospitals as the "experimental health centres" proposed in the white-paper. As you point out, these rural hospitals could take over the medical and nursing care of diagnosed medical cases and also the postoperative care of straightforward surgical cases, thus increasing considerably the turnover of beds in the central specialist hospitals. With the increasing complexity of medical treatment requiring X-ray examinations, blood-counts, multiple injections (especially if penicillin becomes the therapeutic weapon against most bacterial invasions), and four-hourly medication, it becomes necessary to treat more patients in hospital. Where are the beds? All central hospitals are overcrowded with surgical cases and staffed by a preponderance of surgical specialists. GP's could practise better medicine to the benefit of their patients if rural areas had small hospitals developed under the heading of "experimental health centres."

The scarcity of domestic help and the increasing duties devolving on all sections of the community place an impossible strain on the average household when illness develops in one of its members. An increasing number of maternity cases from nearly all sections of the community are choosing to enter maternity homes for their confinements. In a rural and urban area like ours, with a population of about 7000, there is no accommodation within fifty miles for medical cases other than very rare and grave emergencies; the nearest maternity home is fifteen miles and the next thirty miles away. If this state of affairs continues, the rural GP will be unable to practise the art of medicine and will be unable to employ modern methods of treatment.

I hope that those who are to plan the hospital layout in the regions created by the new Health Service will give careful consideration to the need for developing rural hospitals (e.g., experimental health centres) for the treatment of medical cases, the confinement of maternity cases, and the aftercare of patients transferred from the central and predominantly surgical hospitals.

Grange-over-Sands, Lancs. P. D. MULKERN.

STRESS FRACTURES

SIR,—Dr. Hartley had better get out his dictionary again, when he has read, this time more fully, the statements of his with which I originally disagreed. They are: "'Fatigue' fractures are . . . essentially incomplete; *the fracture line is fine and involves only part of the cortex . . . There is never displacement.*" I have italicised the words which I did not think it necessary to quote in my original letter, as I did not expect a verbal quibble to be used to answer me.

Let the position be clear. Hartley says, as clearly as possible, that in these lesions there is no complete fracture and no displacement. I have given unassailable figures, and am prepared to give those of a now larger series, to show not only that the fracture may be complete but that there may also be displacement, sometimes gross. So far, therefore, from supporting his views as he says, I repeat my original assertion—that Dr. Hartley speaks from little experience of large numbers of cases when he makes such unjustifiable statements as those I have quoted from his letter of April 17.

HUGH MORRIS.

AN UNDERGRADUATE MEDICAL SCHOOL AT OXFORD

SIR,—We have read with interest the letter in your issue of May 12, which refers to the undergraduate school of medicine at Oxford. As recently qualified Oxford men, who have received their clinical training at London hospitals, we wish to reinforce the views of our seniors and teachers, and to add certain points from our own experiences.

We agree that it is impossible to choose in advance those preclinical students who will be proficient "teachers, investigators, and consultants," and that it is impossible for a preclinical student to tell in the dissecting-room whether he himself will be proficient. But, even if these things could be done, is it desirable to provide a clinical education for the medical leaders of the future in a segregated manner, and in the secluded atmosphere of an academic city?

After three years at Oxford there are many medical advantages in going to London (or elsewhere) to complete the education. First the student lives and works in the stimulating company of those whose education and ideas differ; the result is mutually beneficial, and a practical outlook on medicine is inculcated. Secondly the three years spent in Southwark, Lambeth, or Whitechapel provi [illegible] nce that cannot be gained in [illegible] ould not all men, in particular [illegible] the better for a change in a [illegible] down to their life's work in Oxford? We presume that Oxford will close its doors to those with the Conjoint and LSA diplomas (as it does at present). The future teachers and consultants from Oxford will therefore be ignorant of the minds of men whom in future they must teach, and with whose methods they will, in practice, be unsympathetic.

During the period of 1940 men were guided in their decision to study clinical medicine at Oxford by the blitzing of the London hospitals. Since then, of those who have remained, a few have stayed to continue with research at the same time. A number have remained purely for the merits of the clinical facilities offered. But already a number have remained behind because of "their sentimental attachments to Oxford."

We feel that Oxford has unique facilities as a postgraduate school and research centre. We hope that the recommendation of the Goodenough report to establish a permanent undergraduate clinical school at Oxford will not be approved without much thought.

A. BATTY SHAW H. R. MORTON M. R. WILLIAMS
D. C. G. BETT J. D. L. REINHOLD V. H. WHEEBLE
G. M. COLSON E. R. SHOETEN-SAC J. T. WRIGHT
R. A. V. DRURY D. VAN ZWANENBERG

London.

TEACHING OF PATHOLOGY

SIR,—The late Professor Rutherford Morison taught pathology to his surgical students precisely on the lines advocated by Dr. Piney in his letter of April 28 (p. 513). A concise account of Morison's teaching is given in *An Introduction to Surgery* by Morison and Saint. Mine is the second edition (1925).

Hounslow. H. C. BROADHURST.

ETHICS OF REPRINT DISTRIBUTION

SIR,—I believe it is in the public interest to re-state the unwritten rules applying to the distribution of reprints. Twice lately a radiologist whom I do not know has sent me such literature, possibly because he thought it might be of more than theoretical interest to me. This practice smacks of advertising and should not be allowed to extend. It is, of course, quite correct to send reprints to those interested either as friends or as members of one's own specialty. If a stranger wishes he can always obtain a copy from the author by writing to him.

London, W1. L. MICHAELIS.

Obituary

GARNETT WRIGHT

M B EDIN., F R C S

AFTER only two days' illness Mr. Garnett Wright died on April 29 at the Salford Royal Hospital, Manchester, where he was senior surgeon.

A Cumberland man by birth, and the son of a banker, he received his schooling at St. Bees and his medical education in Edinburgh. Winning several medals and prizes, he graduated with honours in 1900. The next few years were spent in surgical posts in Ancoats (Manchester), Wolverhampton, and Leicester hospitals, and he took his English FRCS in 1905. Returning to Manchester he joined the honorary staff of the Ancoats Hospital, but in 1910 transferred to the Salford Royal Hospital which he was to serve for 35 years. When the war broke out, having passed the age of 60, he was in partial retirement, but he returned to the management of a full surgical unit.

When at the Ancoats Hospital, Wright was a colleague of Craven Moore during the latter's most productive period of research in gastric patholog[illegible]

[illegible] Association of Surgeons into gastrojejunal ulceration" published in the *British Journal of Surgery* in 1935, and a paper on "secondary jejunal and gastrojejunal ulceration" in the same journal (1919). Another special interest was the surgery of the thyroid gland, and wh[illegible] nchester Medical [illegible] sidential address. [illegible] vere the presiden[illegible] Surgical Society and the Manchester Pathological Society and he was lecturer [illegible] he university.

[illegible] a sound, capable, and careful [illegible] Wright obtained results well above the average. His surgery was approved most by those best capable of appraising it—his surgical peers. Among these his advice was much in request and it was always ungrudgingly given.

In his quiet and unobtrusive way he was a companionable man. Among intimates, as for instance at the club where he lunched, he was beloved and admired, and his views on a wide range of topics were listened to with attention and respect. The same qualities made him a particularly good committee man, and his judgment, acuteness, and good sense proved great assets in the counsels of his own hospital. He was also a keen musician, developing his own voice with considerable assiduity, and was fond of orchestral and operatic music. As a golfer he played off a handicap of four for many years. His interests were many; his mind large and well informed; and he was a strong friend.

HENRY CHARLES RUPERT HIME

CB, DSO, M B VICT.

Major-General Hime, who died on April 21 in his 68th year, was born at Sheffield where his father, Dr. T. W. Hime, was honorary medical officer to the Hospital for Women and lecturer in midwifery at the school of medicine. He studied medicine at Leeds and in 1899 took his MB at the Victoria University of which the Leeds school then formed part. In the same year he joined the RAMC, and as he looked even younger than his years he was quickly dubbed "Boy" Hime by the batch of surgeons on probation, which he and Sir James Hartigan joined at Netley on the same day. "Of a quiet and retiring disposition, Hime was a keen student of his profession," writes Sir James, "and his work as a doctor and later as an administrator was marked by foresight, thoroughness, and efficiency. He was an officer of high principles, and once he had made up his mind as to the right course to adopt he carried it through unflinchingly."

From 1900 to 1902 Hime served in South Africa, taking part in operations in the Transvaal, the Orange River Colony, and in Cape Colony before he returned to England to act as an instructor at the RAMC school.

Soon after the beginning of the last war he was promoted to the rank of lieut-colonel and he served in France as DADMS and later as ADMS. Wounded and five times mentioned in despatches, he was awarded the DSO in 1917. After the war he was for a time officer in charge of RAMC records till in 1926 he was posted to Egypt as DDMS. Four years later he returned to England as DDMS, Southern Command, and he held this post till he retired in 1934 when he was made CB. Two years earlier he had been appointed hon. physician to the King. In 1934 he married Miss Hilda Margaret Moore.

Medicine and the Law

Registration as False Statement

THE emergency arrangements under which medical practitioners with foreign qualifications could be temporarily registered were obviously not crook-proof. The officials of the General Medical Council cannot be blamed for the difficulty of checking the degrees of applicants; many of the latter came to this country with no papers at all. At Manchester assizes recently Mrs. Violet Doreen Warren, aged 41, was sentenced to six months' imprisonment for having procured registration by means of a false declaration. According to her own statement at the trial, she was a registered nurse who had worked as a hospital sister, had qualified in Berlin as MB, and had received the degree of MD for a thesis on the heart and lungs. According to the prosecution, she had replied to the advertisement of a Liverpool doctor who wanted an assistant and had told him she was qualified. She had persuaded a young woman to write from a Flintshire vicarage to the General Medical Council a letter (dictated by the accused) saying that the writer had seen Mrs. Warren's Berlin diplomas. Mrs. Warren told the GMC that her diploma had been destroyed. She gave the police the picturesque detail that Hitler would give £40,000 to keep her quiet "because, when he shot one of his lieutenants in the leg, I extracted the bullet." After verdict and before sentence a police inspector described the accused as a plausible romancer.

The Defence Regulations under which the temporary registration of foreign practitioners is conducted will automatically come to an end on the date when an Order in Council declares the termination of the emergency. They may be revoked at an earlier date, as many have been already. The duration of this particular regulation will presumably depend on the speed with which doctors are released from war-time service. Examples like that of Mrs. Warren suggest that the return to normal conditions will be welcome to the community.

Parliament

QUESTION TIME

Beds for the Tuberculous in Scotland

Dr. R. MCINTYRE asked the Secretary of State for Scotland how many patients suffering from pulmonary tuberculosis were awaiting beds in hospital in Scotland as a whole, and in Glasgow, respectively; and what steps he proposed to take to bring an immediate end to this situation.—Mr. T. JOHNSTON replied: At March 31, 1945, were there 1776 persons in Scotland suffering from pulmonary tuberculosis awaiting admission to hospital. Of this number 1142 were in Glasgow. We have provided 758 beds from the Government's Emergency Hospital scheme, and the number of patients undergoing hospital treatment for pulmonary tuberculosis in Scotland has already been increased by over 60% since the war began. Further beds could be made available but there is a serious shortage of nursing staff and there are obvious difficulties, which the House will readily recognise, in compulsorily directing girls to this service. On this grave problem I am in constant touch with the Minister of Labour and National Service, and he hopes that this question and answer will draw public attention to the desirability of more volunteers being rapidly forthcoming for the nursing of tuberculous patients.

Protection against Cholera

Mr. F. J. BELLENGER asked the Secretary of State for India whether any cases of cholera had occurred amongst British troops serving in India or Burma.—Mr. L. C. AMERY replied: 15 cases of cholera occurred at the end of last month amongst British officers billeted at a hotel in Calcutta. Of these 1 died as a result of developing pneumonia. Afterwards 3 of the waiters were discovered to be cholera-carriers. Immediate action was taken and the outbreak is now at an end. In Burma there have been 26 sporadic cases of cholera, mostly among Indian troops. There have been no other cases of cholera among British troops in India and Burma since 1943. Since cholera is endemic in these areas the comparative immunity of the troops is a tribute to the skill and devotion of the medical services and the value of modern protective measures.

Medical Man Power

Sir HERBERT WILLIAMS asked the Minister if his attention had been drawn to the shortage of doctors in many of the evacuation areas and, having regard to the large number of evacuees about to return to those districts, what steps were being taken to reinforce the strength of the medical profession in those districts.—Mr. WILLINK: Any special shortage of doctors caused by movements of population of the kind referred to is a matter for consideration by the local medical war committee. After taking account of any doctors coming into the area, either on release from the Forces in an early demobilisation group or otherwise, it will be open to the local committee to apply through the Central Medical War Committee for the special release of a practitioner from the Forces.

MINISTRY OF HEALTH.—Mr. H. W. Kerr succeeds Miss Horsbrugh as *parliamentary secretary to the Ministry.* Mr. Kerr, who has been parliamentary private secretary to the Secretary of State for Air since 1942, sits for Oldham.

Public Health

Infectious Disease in England and Wales

WEEK ENDED MAY 12

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1365; whooping-cough, 799; diphtheria, 413; paratyphoid, 3; typhoid, 4; measles (excluding rubella), 12,412; pneumonia (primary or influenzal), 511; puerperal pyrexia, 126; cerebrospinal fever, 53; poliomyelitis, 6; polio-encephalitis, 1; encephalitis lethargica, 1; dysentery, 343; ophthalmia neonatorum, 55; No case of cholera or plague was notified during the week, but there were 2 imported cases of typhus, 1 at Torquay and 1 at Liverpool.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on May 9 was 1059. During the previous week the following cases were admitted: scarlet fever, 53; diphtheria, 28; measles, 99; whooping-cough, 11.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 13 (1) from measles, 6 (0) from whooping-cough, 7 (1) from diphtheria, 38 (3) from diarrhœa and enteritis under two years, and 10 (0) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 171 (corresponding to a rate of 28 per thousand total births), including 14 in London.

WEEK ENDED MAY 19.

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1340; whooping-cough, 1068; diphtheria, 498; paratyphoid, 2; typhoid, 2; measles (excluding rubella), 14,126; pneumonia (primary or influenzal), 612; puerperal pyrexia, 132; cerebrospinal fever, 64; poliomyelitis, 3; polio-encephalitis, 1; encephalitis lethargica, 1; dysentery, 434; ophthalmia neonatorum, 78. No case of cholera or plague was notified during the week. A case of typhus was reported at Elstree, Herts. There were also 6 imported cases, 1 at Brighton, 2 at Cuckfield, and 3 at Bradford.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on May 16 was 1075. During the previous week the following cases were admitted: scarlet fever, 38; diphtheria, 41; measles, 115; whooping-cough, 14.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 3 (0) from measles, 7 (1) from whooping-cough, 4 (0) from diphtheria, 51 (9) from diarrhœa and enteritis under two years, and 13 (0) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 203 (corresponding to a rate of 26 per thousand total births), including 21 in London.

Notes and News

ENGAGEMENT OF NURSES

A PART of the Government's plan for the orderly distribution of men and women who can be released from war jobs in industry now comes into play. Though still empowered to direct if need be, the Ministry of Labour is preparing once more to use its powers of persuasion. The object of the Control of Engagement Order (1945 no. 579) is to ensure that men and women, particularly the younger ones, should go to work of national importance, and this is achieved by arranging that the groups affected should take posts only through appointment offices, employment exchanges, or other approved agencies. All men between the ages of 18 and 50 and all women between 18 and 40 are covered by the order, except for administrators and professional men and women. Because they are scarce and precious, however, nurses and midwives have been included in the order despite their professional status, and the same holds for engineers and chemists, metallurgists, research workers, radiographers, physiotherapists, and nursery nurses so the position of nurses is by no means unique. The new order operates like the old one except that male nurses are now covered. The general effect is that employers may not seek to engage any person within the restricted age groups for any employment other than excepted employments; it is illegal for the employer to engage the person temporarily and then seek approval.

This decision to continue the control of nurses and midwives was made on the advice of the National Advisory Council for their recruitment and distribution, and is in line with their recent recommendation that the year of special service should continue to be exacted from newly qualified nurses. The expediency of these measures at a moment of acute national need of nurses can hardly be questioned, but their ultimate influence on recruitment must not be allowed to escape our minds.

GAS HEATING FOR DISINFESTATION

METHODS of disinfestation of clothing have a special interest just now. The Gas Light and Coke Company and the South Metropolitan Gas Company have collaborated in devising a method of heating a brick built disinfestation oven, 30 ft. long by 6 ft. wide and 8 ft. high. The chamber is open at each end and a conveyor, carrying frames of clothes and blankets, passes through it. The aim has been to bake such articles at 140° F for 10 minutes and at 158° F for a further 10 minutes. These temperatures are achieved by delivering hot air from a gas air heater into the bottom of the oven, the inside of the brick chamber is insulated with 2 in. of plastic asbestos, and insulated doors are fitted at the two ends. Starting with an oven temperature of 200° C it has been found possible to secure an even distribution of heat at the necessary temperatures within a total cycle of 35 minutes, and at such temperatures all eggs and lice are killed.

QUAKERS IN INDIA

SINCE 1942 a section of the Friends Ambulance Unit has been at work in India, at first preparing civil defence against air raids and later relieving those who suffered in the Midnapore cyclone and the Bengal famine.

In 1944 the original party of six men and two women was reinforced by members of the American Friends' Service Committee, which brought the numbers up to 16 men and 8 women. In the cyclone area they began with cholera inoculations, and went on to distribute milk to 4000 infants and mothers, and to arrange homes and reablement centres for the destitute. In June, 1943, they opened a children's hospital in Contai, and later this was handed over to the government. A month later they opened a food canteen in Calcutta, and more had been opened in other cities by the early months of 1944; since then the scheme has been extended and now there are 95 canteens in action, at each of which about 100 selected undernourished children are given a daily meal of rice, dal, and vegetables with meat, fish, or eggs. The section has also arranged the distribution of milk to 25 districts of Bengal under an Indian Red Cross scheme. Milk supplied by the AFSC has been pooled with the IRC milk and now 1028 centres are serving 100,000 mothers and infants daily. Children's clothes are being distributed in winter.

When the worst of the famine was over three industrial centres were opened where people receiving proper rates of pay could learn and practise weaving and dyeing, needlework, and jute spinning. Proceeds from sales cover raw materials and workers' wages, but overhead expenses have to be met in other ways. The section is also at work on village reconstruction, and in Chittagong they are helping the government to start a boat building yard to provide boats at low cost for destitute fishermen. Medical supplies have been imported from America, bought with funds contributed by Americans interested in India's needs; over 6 lakhs of rupees were contributed by American workers. The section has worked in close and friendly touch with Indian voluntary bodies.

This good work has been made possible only by generous contributions, and the need for clothing, milk, and medicines continues to be great. The section has found that there is a special place in India for a joint British and American voluntary organisation with no political affiliations and no missionary purpose. Those who wish to support this venture should send their help to the Secretary, FAU, 4, Gordon Square, London, WC1.

REBUILDING ST. THOMAS'S

IN their survey of the hospital services of London Prof. A. M. H. Gray and Dr Andrew Topping pointed out that of its 682 beds St. Thomas's had lost 308 through bombing. Fairly complete reconstruction was essential and they suggested that the hospital should ultimately be rebuilt with 800–900 beds, and that the Royal Waterloo, the Belgrave, the General Lying-in, and possibly the Royal Eye Hospitals should be amalgamated with it. They also proposed that Lambeth Hospital (LCC) should be closely linked with it through a common medical staff. Meanwhile St. Thomas's is making plans for the immediate future and on May 23 an interim scheme, to cover the period between the end of the war in Europe and its final reconstruction, was presented to the court [illegible] ham, chairman of the [illegible] sed to provide 550 beds [illegible] tpatient department, of about the same size as before the war. This was considered the minimum accommodation to provide adequately for patients and students. Licences were therefore being sought to erect huts for two temporary wards and a medical out-patient department, to repair the Seymour ward and blocks 3–4, 6–7, and 8, and to restore St. John's and St. Thomas's House for nurses in Queen Square. Mr Arthur Howard, a joint treasurer, said the hospital would have to face next year a possible loss of income of £40,000–50,000, while expenditure would probably fall by only £10,000. Last year the hospital had received a windfall of £7000 from a broadcast appeal and many legacies, while with the cessation of casualties EMS grants will probably dwindle. The Lord Mayor stressed the need to avoid this deficit by making it widely known.

University of Oxford

On July 21 the honorary degree of D.Sc. will be conferred on Prof. H. M. Turnbull, FRS.

University of Cambridge

On May 19 the following degrees were conferred:

MD.—W. H. Mylechreest.
MB, B.Chir.—*P. R. A. May.
MB.—*J. W. D. Buttery.

*By proxy.

Royal College of Surgeons of England

The Princess Royal, who is an honorary fellow of the college, has sent a gift to the restoration and development fund. Over £38,000 has already been subscribed, mainly by fellows of the college. The British Medical Association has sent a donation of 1000 guineas.

Two Arris and Gale lectures will be given at the college, Lincoln's Inn Fields, London, W.C.2, at 4 P.M., on June 6 and 11. On Wednesday, the 6th, Dr D. V. Davies will speak on the synovial membrane and the synovial fluid of joints, and on Monday, the 11th, Prof. Francis Davies on the early development of the human embryo.

Royal College of Physicians of Edinburgh

On Friday, June 15, at 5 P.M., at the college, 9 Queen Street, Edinburgh, Mr Norman Dott will deliver the Morison lecture. He is to speak on recent experiences in a neuropsychiatric division of medicine.

Middlesex Hospital

Lord Horder will deliver the third Sanderson Wells lecture at the hospital on Wednesday, June 6, at 4 P.M. His subject will be food and rheumatism.

Middlesex County Medical Society

A clinical meeting of the society will be held at the North Middlesex County Hospital at 3 PM on Saturday, June 9.

Medical Society of the LCC Service

A meeting of the society will be held on Wednesday, June 6, at 3 PM, at the North-Western Hospital and Group Laboratory, Lawn Road, NW3, when there will be a clinical and pathological demonstration of puerperal sepsis and gastro-enteritis.

Biochemical Society

A meeting of the society will be held in the Institute of Physiology, University of Glasgow, on Saturday, June 9, at 11.30 AM, when short communications and a demonstration will be given.

Society of Chemical Industry

A meeting of the nutrition panel of the society is to be held at the rooms of the Chemical Society, Burlington House, Piccadilly, London, W1, on Wednesday, June 6, at 2.30 PM, when Dr. D. P. Cuthbertson will speak on the preparation and clinical use of protein hydrolysates.

Royal Society of Arts

The lecture by Dr. F. M. R. Walshe on infantile paralysis, which was postponed owing to VE holidays, will now be held on Tuesday, June 12, at 1.45 PM, at the house of the society, John Adam Street, London, WC2.

Recruitment of Nurses for India and Far East

State-registered and other nurses are urgently required for Service hospitals in the Far East, particularly in India. The requirements include 1000 SRNs and in addition a number of unqualified nurses with six months' or more experience of nursing to serve as members of Voluntary Aid Detachments. Applications cannot be accepted from newly qualified and practising midwives, or midwives with recent experience, from nurses holding high administrative and teaching posts, or from certain other groups of nurses with specialised experience or who are employed in hospitals or services where there is a particularly acute shortage of staff.

Royal Society of Medicine

There will be a general meeting of fellows at 5 PM on Tuesday, June 5. At the same hour, at the section of psychiatry, short papers will be read by the following American psychiatrists: Dr. Karl Menninger, Dr. John Whitehorn, Dr. Lawrence Kubie, Dr. John Romano, and Dr. Leo Barte Meier. On June 6, at 2.30 PM, at the section of history of medicine, Dr. H. P. Bayon will read a centenary note on Charles Louis Alphonse Laveran, and Dr. W. S. Jones will read a paper on Hippocrates and compare the science of health among the Greeks and in modern days. On June 8, at 5 PM, at the section of ophthalmology, Dr. W. Russell Brain, Prof. Ida Mann, Mr. Harvey Jackson, and Major J. H. Mulvany will open a discussion on exophthalmos and endocrine disturbance.

Conference on Maternity and Child Welfare

On behalf of the National Council for Maternity and Child Welfare, the National Association of Maternity and Child Welfare Centres and for the Prevention of Infant Mortality has arranged a conference to be held at Friends House, Euston Road, London, NW1, on Thursday and Friday, June 28 and 29. Dr. Jane Turnbull, chairman of the association, will open the conference at 10.30 AM on the 28th, and afterwards Prof. S. J. Cowell, FRCP, Dr. Margaret Wright, and Miss R. M. Simmonds, SRN, will open a discussion on nutrition as it affects the well-being of expectant mothers and of children. At 2.15 PM Dr. Robert Sutherland will speak on the place of films in health education, and there will be a show of films dealing with maternity and child welfare. Mr. H. U. Willink, the Minister of Health, will deliver his presidential address at 10.30 AM on the 29th, and at 11 AM Dr. Nora Wattie, Miss G. L. Reed, and Dr. Alan Moncrieff will open a discussion on the importance of maintaining the unity of the maternity and child-welfare services. At 2.15 PM the Archbishop of Westminster, Dr. Leslie Housden, and Dr. Grantley Dick Read will be the opening speakers in a discussion on the State and the parent in relation to the child. Further information from the secretary of the association, Carnegie House, 117, Piccadilly, W1.

In connexion with the conference the maternity and child-welfare group of the Society of MOHs has arranged to hold a clinical course for medical practitioners on Saturday [illegible]orning and afternoon, June 30.

Royal Medical Benevolent Fund

The annual meeting will be held on Wednesday, June 20, at 3.30 PM, at the house of the Medical Society of London, 11, Chandos Street, W1.

Royal Free Hospital

On Thursday, June 21, at 3 PM, Princess Elizabeth will distribute the prizes and certificates to members of the London School of Medicine for Women. The prize-giving will be held at BMA House, Tavistock Square, London, WC1.

Medical Insurance Agency

At the annual meeting on May 23, allocations to medical charities were authorised by which they will profit to the extent of £5113. Sir Robert Hutchison was re-elected chairman and the following were elected to the committee of management for three years: Mr. N. Bishop Harman, Sir Ewen Maclean, Sir Francis Fraser, Sir Robert Hutchison, Mr. H. S. Souttar, and Dr. G. Roche Lynch.

Warning against VD

A photographic display has been produced for use in the educational campaign against venereal diseases. This display tells frankly what the dis[illegible], what are their effects, and why [illegible] tained at the earliest possible st[illegible] showing to men and women se[illegible] by the Ministry of Information to factories. [illegible] available to local authorities through t[illegible] Health Education, Tavistock House, [illegible], London, WC1.

Appointments

LEBRUN, H. I., MB SHEFF.: RSO, Princess Beatrice Hospital, London, SW5.
MCLEAN, W. F., MO, MD EDIN.: medical referee for Haddington sheriff-court district.
OGILVIE, Major-General W. H., M CH, DM OXFD, FRCS: senior surgeon to the Royal Buckinghamshire Hospital, Aylesbury.
REID, J. R., MB GLASG.: MO, Fiji.
SUTHERLAND, V. L., MB ABERD.: asst. MO, Jamaica.
WALLACE, H. J., MD CAMB., MRCP: senior dermatologist to the King Edward VII Hospital, Windsor.

Births, Marriages, and Deaths

BIRTHS

BARENDT.—On May 24, the wife of Dr. G. H. Barendt of Southampton—a son.

BAILEY.—On May 17, at Portsmouth, the wife of Dr. Kenneth Bailey—a daughter.

BOLSOVER.—On May 23, at Oxford, the wife of Captain G. D. Bolsover, RAMC—a daughter.

BOWESMAN.—On May 21, the wife of Dr. Reginald Bowesman of Billericay, Essex—a daughter.

BUSBY.—On May 20, at Leicester, the wife of Dr. John C. Busby, Colonial Medical Service—a son.

FRANCIS.—On May 24, in London, the wife of Surgeon Lieutenant R. S. Francis, RNVR—a son.

GRENVILLE-MATHERS.—On May 26, the wife of Dr. R. Grenville-Mathers—a son.

KING LEWIS.—On May 24, at Worcester, the wife of Dr. P. C. King Lewis, of Bromyard, Herefordshire—a daughter.

MISKELLY.—On May 23, at Perth, the wife of Surgeon Lieutenant Ian Miskelly, DSC, RNVR—a son.

PAUL.—On May 18, at Chester, the wife of Dr. M. B. Paul—a son.

ROOKE.—On May 18, at Norwich, the wife of Surgeon Lieutenant C. J. Rooke, RNVR, of Southwold—a son.

MARRIAGES

GRANT—GLANVILLE.—On May 9, at Aldenham, Herts, Charles Landale Grant, lieut.-colonel RAMC, to Phyllis Glanville.

MILLS—HARRIS.—On May 17, at East Sheen, SW, Peter J. W. Mills, MRCP, to Bronwen Margaret Harris.

DEATHS

CROOKES.—On May 9, Frank Raymond Crookes, BM OXFD, of Eckington, Derbyshire, aged 39.

DICK.—On May 20, at Leeds, John Dick, MB EDIN., medical superintendent, St. James' Hospital, Leeds, aged 51.

EATON.—On May 13, at Cleator Moor, Cumberland, William Stanforth Eaton, MB EDIN.

MEIKLE.—On May 25, in Edinburgh, John Hally Meikle, MD EDIN., B SC, DPH.

MILLIGAN.—On May 20, at Lytham, Lancs, Wilfred Egerton Milligan, MB LOND., aged 56.

O'SULLIVAN.—On Dec. 12, at St. Peter Port, Guernsey, Humphrey Donnell O'Sullivan, BA, MB CAMB., formerly of Burton-on-Trent, aged 71.

WILSON.—On May 5, George Wilson, MB EDIN., lieut.-colonel RAMC, retd.

[illegible] in short supply owing
[illegible]er should not be taken
[illegible] available for export.

TOTAL MEDICINE

A HARVEIAN LECTURE *

SIR ALEXANDER HOOD, KCB, CBE,
MD EDIN., FRCP, KHP
LIEUT.-GENERAL; DIRECTOR GENERAL, ARMY MEDICAL SERVICES

IN the course of the wars in which we have been involved through the centuries most famous medical men have spent some time on active service, and William Harvey was no exception. It is appropriate that an Army doctor should draw attention to his military services, although the accounts of them are relatively few and meagre.

Harvey
Charles I
1642. Th
valent of our regimental aid-post close to Charles' headquarters. It is probable that besides being responsible for the King's health he was also in attendance on his staff and the personnel of his headquarters. He was the counterpart of the surgeon on the staff of a modern commander-in-chief. At his time of life it says much for his constitution that he established his regimental aid-post in a ditch. There he sat reading, finding time hang heavily on his hands, as so many doctors have found since in war, until, as Aubrey[1] says, "the bullet from a great gun grazed the ground near him which made him remove his station."

In addition to his other duties Harvey had personal charge at this time of two future Kings of England, the boy princes later Charles II and James II; and they too were with him in the ditch. He attended the wounded in this action, and is credited with restoring to life one Adrian Scrope who had been left for dead and whose son brought him to Harvey.

After this battle he retired with the King to the base t Oxford, which was a position more in accordance with his years and his eminence in the profession; and here he had experience of what seems likely to have been yphus fever, for he attended Prince Rupert's brother, Prince Maurice, in October, 1643, for what a contemporary correspondent[2] calls "the ordinary raging disease of the Army, a slow fever with great dejection of strength."

He remained in Oxford carrying on what in a modern army we would call the duties of staff surgeon in medical attendance on headquarters until some time in 1646 when he returned to London and so ended his army service. It is permissible perhaps to speculate on how he would have delighted in modern army medical methods, and particularly in the blood-transfusion service.

Harvey was a master of experiment, observation, and deduction, and in the Army Medical Services there is an experiment in group or social medicine which merits observation at the present time, and from which useful deductions ought to be available.

Scope of a Medical Service

Medicine and war have much in common. The doctor's whole life is a ceaseless battle against disease, and too often a defensive one. The latest form of warfare in which we have been engaged has been called total war. This expression, coined by our enemies, indicates that the whole resources of a nation are bent to the task of achieving its ends by force of arms.

If the same purpose and will were exhibited to ensure that nothing is lacking which medicine can offer to a community to enable its individual units to play their part in life to the full, to their own and the community's advantage, and to enjoy the playing, then that community would have total medicine.

The Army Medical Services have endeavoured to do this for a limited section of the community, and I propose to examine the method of provision, its application, and some of its results. The keynote of all medical services should be prevention, and the definition of medicine should be wide and comprehensive. Everything which affects the mental or physical health of the community is the concern of the medical services; our aim is to have a community of fit individuals, not merely healthy in the sense that they show no clinical signs of disease, but fighting fit, trained and looked after even as a racehorse is—for surely people are greater assets to the nation than its bloodstock, although that many receive less care and consideration cannot be doubted.

The field of the Church encloses everything that affects the spiritual life of the individual and the community. The extent of the Church's charge is recognised by the State, and the Lords Spiritual have their places by right in the Upper House of Parliament along with certain of the Law Lords. A famous Prime Minister[3] said: "the health of the people is really the foundation upon which all their happiness, and all their powers as a State, depends." Yet those responsible for the cure of bodies have no places reserved for them in the highest council chamber of the nation beside those responsible for the cure of souls. If medicine, like the Church, is to be by law established, should it not have the same representation and the same opportunity of having its voice heard? If the voice of medicine had been sufficiently powerful in this country, that lamentable record of the failure of our civilisation, *Our Towns*, would never have been written. If it does not become more powerful it is doubtful if we as a nation shall retain our present high place in the world.

Medicine in the eyes of all but an enlightened minority consists in caring for the sick, in fact a salvage service. The white-paper, a National Health Service, discusses the interpretation of a comprehensive health service, and while recognising the true width of the medical field confines its main discussion to curative medicine and makes no attempt to bring the whole of medicine into one integrated service.

The Army Medical Services, which include a dental service and a nursing service, do give a pattern of such an integrated service; for within its orbit are included a school medical service, an industrial medical service, a prison medical service, a public health service, a supply service, a research service, a psychiatric service. It deals in antenatal care, in physical and mental fitness, in selection, in the training of medical personnel—doctors at postgraduate courses which are compulsory, and others such as the laboratory assistant operating-
room urse,
clinica

In a been
region. ces-
nded, with outlying smaller
ases. Where the provision is
her a soldier nor his wife or
waiting-list for a hospital bed.
Specialist consultation and all forms of technical and laboratory examination are provided for all members of the Army, freely, efficiently, and promptly, in peace as in war. The man or woman in the services in peace or war has better medical care, both preventive and remedial, than the inhabitants of rural districts and the poor in this country, and that medical care is more readily available. This statement is supported by all those with whom I have discussed it who are in a position to judge.

This has been done by good organisation and administration. If a medical service for a community does not include the whole of medicine working as one, then there will be much wasted effort either in duplication or in liaison and a tendency for vested interests to obscure and obstruct the effort.

Administration of Army Medicine

The Army Medical Services have a central and a peripheral administrative structure. The central, at the War Office, is part of the charge of the member of the Army Council responsible for personnel, the Adjutant-General, who is responsible to the Secretary of State for War, who in turn is responsible to Parli

The Army Office is
directed by th adviser of
the Secretary with the
health of the . Under
his administr es of hygiene,
pathology, research and statistics, psychiatry, dentistry

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* The Harveian lecture of the Harveian Society delivered at the Royal College of Surgeons on May 28.

and nursing, presided over by directors doing administrative as well as professional work. Doing professional work and advising administratively there are consultants in anæsthetics, dermatology, dental surgery, gynæcology and diseases of women, malariology, medicine, neurology, neurosurgery, ophthalmology; orthopædic surgery, otorhinolaryngology, psychiatry, psychology, radiology, tropical diseases, surgery, and venereal diseases, and honorary consultants in plastic and in thoracic surgery. These directors and consultants, with consultants from the periphery, meet monthly to discuss problems and to make recommendations; all have direct access to the Director-General; all travel widely to advise and to spread the gospel of their own subject; and they prepare for issue clinical recommendations and directives which are published for the information and guidance of officers. They are served by a secretarial branch, which it is hoped to develop into a directorate of clinical services, and it is the duty of the administrative and operational branches to translate recommendations into suitable administrative action. Examples of this are the fitting of specialist officers into suitable appointments or the provision of special equipment.

Consultants are brought in to advise on the planning for military operations. For example, the staffing and equipping of ships used for landing tanks to enable them to bring patients off the beaches on D-day was done on the advice of consulting surgeons to the Army and Navy after they had visited one of these vessels, and in consultation with the consulting surgeons of the Canadian and American armies. The consultants meet and confer with their colleagues of the other services and the EMS. They are encouraged to bring anything to notice which will help to make the service more efficient whether it lies within their special field or not. They are in close touch with the Medical Research Council, and many of them are members of MRC committees; and they correspond freely with their colleagues in the commands overseas.

Non-medical officers are employed in many administrative duties, and it is often argued by the superficial observer that nearly all medical administration can quite easily be done by laymen with advice from doctors. But often that means two men doing one man's job. I feel that to administer a medical service the key posts require to be held by doctors.

Not all doctors, however, make good administrators. And here I would like to digress and consider medical administrators in general, a question which is exercising many of the profession at the moment.

In the service we have much experience of administrators. What is required is not the specialist in administration, but the doctor who has worked his way through many and various departments and specialties before starting to administer; like the managing director of a factory, the best man is the one who has the widest knowledge of all the processes of that factory and preferably from practical experience—an executive passing from minor part-time administration till he finally graduates as a whole-time administrator. But even above his knowledge I would rate his imperturbability and cheerfulness. He must be open to suggestion, yet not too suggestible, and ready to admit his own mistakes and correct them. He must keep ever before his mind the object of his service and have a fine sense of proportion; for his advisers will be enthusiasts with the biased view of their kind—who would have it otherwise?—and while tempering their enthusiasm to meet his purpose he must keep it fired to boiling-point. He should not be chair-bound nor detail-minded, and he requires leisure to think and an infinite capacity for getting his thoughts translated into action. He should be prepared to meet much criticism; for medicine still retains an aura of mystery which is resented by the uninitiated, and that resentment finds relief in a readiness to believe almost anything to the discredit of a medical service. He must not let his enthusiasm perish on the barren rocks of frustration, for if the aim of his service is sound, and its administration and composition fitting, it will progress slowly towards its goal.

DISCIPLINE AND FREEDOM

There are certain requisites for an efficient medical service; there must be administrative discipline with clinical freedom, and there must be an element of discipline in those who receive the service. By that I mean that those comprising the service must carry out orders regarding, for example, methods of supply, hours of duty, reliefs for personnel sick or on leave, place of residence, and so on. By clinical freedom I mean that every doctor is free to treat his patient as he thinks fit and is solely responsible for that treatment. A doctor in a service speaks of my patient and my service; the service talks of our patients; a good service is a brotherhood of teams with an individual and a joint responsibility felt and shared by all its members. Consideration for the patient would, however, override all other considerations.

Suppose in one hospital the mortality-rate for a certain condition was 20%, whereas in all others it was below 10%; the director would rightly cause his consultants to inquire and put matters right, or it might be necessary in the in[illegible] orders to be issued that certain [illegible] undertaken in certain hospitals. These orders would be issued in the case of the Army Medical Services by the Director-General on the advice of the consultants' committee. In this way the patient is guarded against inefficient or inexperienced treatment. This can and does happen in a disciplined service, it cannot happen otherwise. There should be absolute freedom to publish clinical and scientific papers by all members of the service. There should be frequent discussion round a table at which doctors doing administrative work and clinicians exchange views and agree on procedure, the aim being the efficiency of the service.

There must also be some discipline amongst the recipients of the service; they must comply with hours and places of attendance, they must go to the hospital appropriate to their condition, and they must accept the doctor allotted to them. Free choice of doctor is unattainable in a medical service, and the idea that the patient is the best judge of a doctor is not one to which most doctors would agree; the placing of doctors by medical administrators on the advice of a consultant committee will result in a more efficient service for the patients.

AN INTEGRATED SERVICE

The central administration of the Army Medical Services then is charged with recruitment and training of personnel, doctors, dentists, and nurses, and of placing them in bulk (or in detail in certain cases) and the other ancillaries of providing hospital accommodation, and all the necessary furnishings and equipment, in the right place and in the correct quantity, and maintaining them and bringing them up to date; with supervising by means of its consultants and specialists the treatment given and the results produced, and on their advice issuing directives for guidance. It has also the duty of advising the Secretary of State on all matters affecting the health of the soldier or his family in such things as accommodation, nutrition, clothing in various climates, prevention of disease by inoculation or other special methods, promotion of physical fitness, the design of training, selection of personnel, and assessment of mental and physical fitness for different forms of employment and for different parts of the world. Research in all its aspects and the promulgation of new procedures is a very important part of its functions—advice in the design of the tools of the soldier's calling from the physiological and psychological aspects.

It seems therefore that the Army Medical Service is designed to provide total medicine as I have defined it. The Army has one complete medical service integrated to serve every need. But it is one thing to provide, it is another to have full use made of it. We are called upon in the obvious things like accommodation, ventilation, nutrition, and water-supplies, by the parent departments to advise; but it has only been by education that we have shown the Army that we can help in many other ways—in such things as design of weapons or vehicles, in protection against accidents as well as disease, in morale, in education, on the evaluation of the physical and mental effectiveness of weapons, on inoculation to noise—in other words, in fitting the soldier for his job.

It is becoming more and more recognised in the Army that the medical services are the authorities on man and all that concerns him, and we are being consulted more and more freely. Indeed there is a tendency for branches to want their own special medical officers, and some have them; but they belong to our service and keep us in touch with all that affects their special subject and have the benefit of our organisation. All our experts are available to advise on their particular problem.

At the periphery the central administration is repeated on a smaller scale and the service is regionalised; it deals with the details of implementing the policy laid down by the central administration. The sick man attends a medical inspection room, and is seen by a doctor who either treats him as an outpatient or has him admitted to a reception station which is designed to take patients who require more care and comfort than can be provided in a barrack or hut but do not need hospital treatment. Or he may go to hospital. Our Army hospitals have the same special departments and specialists as civil hospitals, but they have no waiting-lists; every man is admitted at once because the importance of man-power and waste of man-days is recognised in the Army as it is in many industries, especially in America, some of which now provide a complete hospital service for their employees to avoid waiting-lists.

Many of you have read of the Clyde Basin Experiment in Scotland whereby a man who was below par was thoroughly examined by specialists and all laboratory or other examinations were carried out, admission to hospital being arranged, or special treatment given. This has been Army medical practice for years before the war; the medical officer could and did send any man or woman in his care to the central hospital where all necessary examinations by specialists were done and treatment was ordered as necessary. In addition all [illegible] tions in certain types of cases.

Achievements in Peace-time

I would like now to consider some examples of the lesser-known but very important achievements of the Army Medical Services in peace-time, for I have found that the vast majority of the civilian profession know nothing of them. They are important from the point of view of national health.

POSITIVE HEALTH

One of these was the experiment of the establishment of a Recruits Physical Development Centre. For some time before the war there was considerable difficulty in getting recruits for the Army; so much so that our physical standards were lowered, and yet the difficulty went on. It was decided that certain recruits, who were below even our lowered standards, should be enlisted provisionally and sent to a special depot known as the Recruits Physical Development Depot, and that an attempt should be made there to improve their physical condition to enable them to reach acceptable standards. These men would normally have been rejected because they did not reach the minimum standards of height, weight, and chest measurement (the so-called undersized recruit); or because of some physical defect, such as scoliosis, flat feet, or tachycardia and general debility (the so-called borderline recruit); or in some cases of course for both reasons.

Not only were these men physically unfit, they were mentally apathetic; they came mostly from industrial areas and large towns. The depot set about to change both their physical state and their mental outlook; it provided a good environment, long periods of sound sleep, hard work and healthy recreation, and good food—the Army ration plus milk and fruit. The results were heartening; of over 800 lads who went through the depot 87% were made physically fit for acceptance into the Army in an average period of nine weeks.

Apart altogether however from the improvement in their physical condition, the alteration in their mentality was from a national and social point of view much more important; they were happy, alert, eager to learn; from national liabilities they had become national assets. This has been carried on in war and the work of our physical development centres is well known. It is to be hoped that it will be carried on in peace. This was an experiment in the production of positive health.

SAFER CHILDBIRTH

In a different sphere the organisation and administration of the Army Medical Services has proved significant and successful [illegible] pondence [illegible] maternal [illegible] on record his experiences[4] in the Army. I must quote at length from his letter:

> "I [illegible] hospit [illegible] in whi [illegible] place under my supervision. There were two maternal deaths, one from pulmonary embolism in 1920 and one in 1921 from advanced mitral valve disease in a woman who had just joined the district and who had not been to the antenatal clinic. This compares favourably with the national death-rate of one mother for every 275 births. The confinements included all sorts of complications, mostly recognised antenatally and therefore to a great extent deprived of their risks—cases of contracted pelvis requiring cæsarean section, placenta prævia, tumours of the cervix, valvular disease of heart, toxæmias, &c., and one 24 lb. baby. Not a single case of eclampsia occurred during the past two years, although many cases with pre-eclamptic signs and symptoms were treated and cured and passed through labour safely. External version was done fifty-four times for breech presentations in the antenatal department without anæsthesia."

These results were, I think, remarkable, and if doctors and patients surrendered something of their freedom to attain them, both doctors and patients would think it worth while.

This good work went on; in 1935, for example, 2791 cases of parturition were treated in military families' hospitals at home and abroad with four maternal deaths, a rate of 1·43 per 1000 births.

The organisation required consisted in the training of officers, sisters, and other staff, and their selection for appropriate posts; the provision of hospitals adequately equipped; the provision of antenatal supervision; education of the soldiers' wives; adequate diet and good accommodation; and the formation of local welfare committees. To set up this organisation the medical services had first to convince the authorities that it was necessary—the voice of medicine had to be powerful enough to obtain what was required. Dame Janet Campbell,[6] commenting on this work, wrote:

> "If such results can be secured by organisation and good management for one section of the community, why not for all mothers?"

At that time the voice of civilian medicine was still [illegible] the organisation and [illegible] Army doctors [illegible] Campbell [illegible] have been saved and much misery avoided.

As late as 1937 the situation was not yet satisfactory, for in circular 1622 (May 7), the Ministry of Health, referring to a report on maternal mortality, said:

> "The disturbing circumstances in which the special investigations had their genesis is not that the number of maternal deaths is in itself high but that it is known that many of the deaths are preventable, that the mortality-rate is higher than it should be and that all efforts have so far failed to reduce it appreciably."

That is a confession of failure and an indictment of the presen [illegible] dying [illegible] shown [illegible] medici [illegible] admini [illegible] working under one administration, to produce the results in the Army which I have quoted.

INFECTIONS

In remedial medicine where clinical opportunities present themselves, as for example in tropical countries where malaria and dysentery abound, Army medical officers have shown that their clinical remedial work is of a standard second to none. In venereal disease, methods of diagnosis and treatment in the services have been of a high standard, and the services have given many eminent venereologists to the civil profession. In the years 1930–33 there were several outbreaks of cerebrospinal fever in this country in which the Army suffered. Many bacteriologists were endeavouring to produce a serum which would be not only bactericidal but also antitoxic, and we in the Army were supplying numbers of different strains of meningococci for this purpose. This brought us into close touch with those who were dealing with the outbreak in all parts of the country, and at the end of 1933 one leading authority expressed the opinion that in the diagnosis and treatment of cerebrospinal fever the Army led the profession.

Medicine and the Community

I have endeavoured briefly to outline the organisation and results of a medical service designed to provide what I have termed "total medicine" to a community. It is, I hope, not unprofitable to attempt to draw deductions from this and from an experience of over thirty years in that service.

Wherever you have a service it implies that those comprising it are servants: and no servants can be free; they must have masters. Freedom and efficiency—especially efficiency in war—are incompatible; and those who provide a total medical service are fighting a war and must sacrifice some of their freedom on the altar of efficiency and so must the community. Complete freedom is anarchy and complete efficiency is slavery; somewhere between the two lies the choice. To make that choice is the duty of the whole community in possession of the facts; the advantages and the disadvantages. It should be arrived at by judgments based on cold scientific truth and a balance-sheet of profit and loss; if it is a compromise acceptable to the community and to the doctors it will gradually progress to such perfection as the community and the medical profession deserve.

The soldier and the doctor looking after him have surrendered some of their freedom to obtain greater efficiency in the purpose of the Army, the defence of the country. For this surrender of freedom the soldier in peace is well housed, well clothed, and well fed, with regular hours of work and play, all under expert medical supervision, and immediate admission to hospital when necessary. His wife and family, when he is married on the strength, receive the same medical benefits. He is in fact the subject of a benevolent dictatorship which allows him as much freedom in his choice of medical treatment as is reasonable; for example, he can refuse operation and the British Army is the only army fighting in this war in which a soldier can refuse vaccination and inoculation—although many clients of transportation companies cannot so refuse. As I said before, he is better off than his counterpart in civil life as regards even remedial medical care.

It is arguable that outside the services the best medical care, including housing and feeding, for the remainder of most communities, is that provided for criminals and psychotics.

THE DOCTOR'S ATTITUDE

What of the doctor in a service providing total medicine? I feel that he must have a different outlook on medicine from that which most doctors have when they first become qualified or when they have practised nothing but remedial medicine.

Dawson,[6] in an address on medicine and statesmanship, referring to the last part of the 19th century, said

> "During the same period doctors were concerned for the most part with people so entirely sick that they were detached for the time being from the stream of life, and in looking after this cloistered class the doctors themselves were apt to become cloistered in thought."

This is still true of most doctors. It is not their fault; the whole stress of teaching in medicine is on the pathological individual, and the livelihood of the doctor depends on his ability to salvage pathological wrecks rather than to create and preserve physical and mental efficiency. In fact this preventive side of medicine with its great opportunities is looked upon as one of the drawbacks of a medical service; lack of clinical opportunity is given as one of the reasons why the Army Medical Service is not popular with doctors in peacetime.

A community will not get full value from its doctors until that whole attitude is changed. That a change is coming is evident from the recent creation of chairs of social medicine which ought to be but the beginning of an evolution which will spread right through the curriculum. The sick man is in the vast majority of cases a failure of the medical services of the community. That outlook prevails in the Army—a unit commander keeps an eye on his sick-list; he asks his medical officer why he has so many sick and what he is doing to prevent it. That becomes part of every Army doctor's outlook, so that the neuro-surgeon leads in the design of helmets for motor-cyclists; the dermatologist and the psychiatrist get together in the prevention of certain skin diseases; the physician, the hygienist, and the pathologist combine to fight against dysentery and malaria; the clinicians cease to pay lip service to preventive medicine, and come out to take the offensive against disease—and in all forms of warfare to take the offensive and dictate to the enemy is the best form of defence.

EMERGENCIES

There is one aspect of a medical service I have not touched upon—namely, its preparedness to meet emergency. In the fighting services our emergencies may be war, disease, or acts of God; in a civil community a medical service should prepare schemes in advance for famine, flood, earthquake, epidemics, and so on. In many communities the planning is left entirely to the public health services. I feel certain that more is required and that an integrated service providing total medicine could produce better and more economical measures. It is when these emergencies arise that the administration of a medical service is tested; the Army Medical Services after nearly six years of war in which they have attained no small measure of success may well be thankful for those administrators of the days between the wars who in spite of much discouragement and many handicaps laid such sound foundation.

CONCLUSION

I have presented to you a very incomplete and fragmentary description of a service which can be looked upon as an experiment (although not designed as such) which has been going on for many years. It has been a gradual evolution and it has endeavoured to ensure that all that medicine in its widest sense could do was being done for a limited and selected community.

I must make it quite clear that I am advocating nothing in the shape of any type of medical service for any particular community, group of people, or country; but in faint and feeble pursuit of the Harveian method I would attempt to draw such deductions from the experiment as I can—being an admittedly biased observer.

What can be deduced from the experiences and the structure of the Army Medical Services by a community desirous to get the best out of its doctors?

> Firstly, that community must ensure that the authentic voice of medicine is audible and clearly heard above any political or other clamour.
>
> Secondly, some freedom must be surrendered by the community and by doctors, the degree of that surrender to be arrived at slowly and deliberately by trial and error and evolution.
>
> Thirdly, the whole of the bountiful gifts medicine can confer in a community are most efficiently and economically applied through a single integrated service.

These are some of the deductions. But however careful and far-seeing the planning, however broad and open-minded the scheme of administration, the execution depends on the quality of the doctors. The community must see to it that the service they desire attracts the right men; it must be so designed as to bring forth votaries who see within its framework opportunities of great adventure and rich achievement and the leisure to contemplate their handiwork.

In the words of Kipling:

> Man dies too soon beside his works half planned.
> His days are counted and reprieve is vain.
> Who shall entreat with death to stay his hand
> Or cloak the shameful nakedness of pain?
> Send here the bold, the seekers of the way,
> The passionless, the unshakeable of soul.
> Who serve the inmost mysteries of man's clay
> And ask no more than leave to make them whole

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EFFECT OF UNDERWATER EXPLOSIONS ON THE HUMAN BODY

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DURING these five and a half years of total warfare, any hundreds of men have been in the sea when depth harges, mines, or torpedoes have exploded, and injuries ave resulted. Quite a number of clinical cases have een recorded and the case-fatality rates have ranged rom 20 to 80 per cent. Investigations undertaken by he Royal Navy have shown that lesions similar to those ccurring in men subjected to immersion blast can be roduced experimentally in animals. Very little has een published on the physical aspect of immersion blast, nd I am therefore publishing this short account.

PROPAGATION OF EXPLOSION PULSES

To judge the probable effects of a distant explosion n a human body partially or wholly immersed in water, t is necessary to know something of the laws which overn the propagation and reflexion of explosion pulses.

The pressure pulse from a high-explosive charge onsists of a very rapid, almost instantaneous rise of ressure to a maximum, followed by a much more radual falling off of the pressure to zero, the whole ulse lasting a few milliseconds (fig. 1). Special gauges which respond to hydrostatic pressures are used for btaining pressure-time curves of these underwater xplosions. The chief feature of these gauges is the eproduction of an undistorted record of the pressure-time curve, which for a slow burning propellant will show a time of rise to maximum pressure (p-max) of approximately 10^{-3} seconds, whereas after the detonation of a high explosive the time to reach p-max will be of the order of 10^{-4} seconds, with a time of decay of a few milliseconds for say a 300 lb. charge.

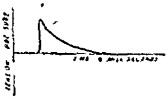

Fig. 1—Original form of pressure pulse before reflexion.

Let us assume that a hypothe-
shown in fig. 1 acts on the
l period of the gauge is
of rise to p-max—in other

equal to the ordinary velocity of sound in water (5000 feet a second). This only holds in the case of weak waves as it relies on the assumption that the compression of the medium is indefinitely small.

Near the charge, where there is enormous compression of the water, such laws of sound cannot be applied, for the velocity of sound increases with pressure, so the steep front of the pulse remains steep and the time of decay of the pulse tends to increase as the pulse travels forward; the high-pressure point of the pulse thus gets further and further ahead of the low-pressure tail. In addition to this, with the very high pressure and velocities that exist in the water near the charge one cannot neglect the dissipation of energy due to viscosity and heat-conduction. The effect of this is that the inverse distance laws for pressur
of
pressure) are not valid for
the
charge, but hold to a good
lse
has travelled a distance of the order of 20 times the linear dimensions of the charge. After this the effects of dissipation and pressure on velocity become negligible and the pulse is propagated equally in all directions from the charge about 5000 feet a second.

REFLEXION

At a refl
very differe
intensity.
sea (fig. 2).
laws of reflexion, but its form is always somewhat distorted, even if the reflector is hard rock. With soft mud the distortion is very obvious, and the reflexion may sometimes seem to come from a reflecting layer some way below the actual surface of the mud. For very soft mud there may be no reflexion at all. If the charge is actually fired on the bottom (fig. 2a) there is no reflected pulse, but the primary pulse may be stronger than it would have been for the charge in mid-water (fig. 2b).

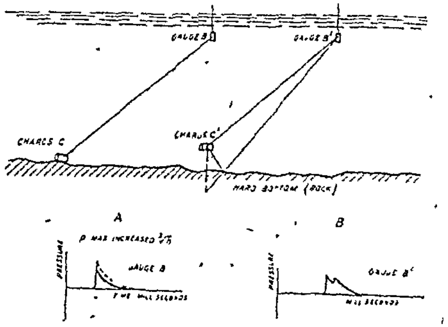

Fig 2—Pressure-gauge readings from an explosion (A) near the bottom; and (B) slightly above a hard rock bottom. (The surface cut off has not been included in the records.)

The phenomena which occur when an explosion pulse is reflected at an air-water boundary are more spectacular. A very feeble pressure pulse (from a charge at a great distance) is reflected exactly like a sound wave—that is, the pressure pulse is reflected as a tension pulse, and an observer with a pressure gauge just below the surface would observe both a direct pulse (pressure) and a reflected pulse (tension) separated by a time interval corresponding to the difference between the two acoustic paths (figs. 3 and 4).

For a more intense pulse (fig. 5) substantially the same thing occurs in the first place, but the situation is now complicated by the fact that water can only stand a very small sustained tension (about 100 lb. per sq. in.) as compared with the peak pressure of about 1000 lb. per sq. in. (due to a 300 lb. charge of TNT at 100 feet). The reflexion starts normally, but as soon as we reach the stage where the sum of the direct and reflected pressure pulses amounts to a tension greater than the critical value, the water breaks at that point, the top layer of water being thrown into the air with a considerable velocity in the form of spray known as the "dome" from its shape (fig. 6). A new reflecting surface is thus formed at the break, and further layers may be torn off by a similar process of reflexion of the remaining part of the pressure pulse. The net result of all this is that we observe not a positive and a negative pressure pulse added together, but merely that part of the positive pulse which occurs before the negative pulse arrives at the gauge. After the arrival of the negative pulse, the net pressure drops to practically zero, or to a small negative value. Reference to the diagrams (figs. 1-5) may help to clarify the situation.

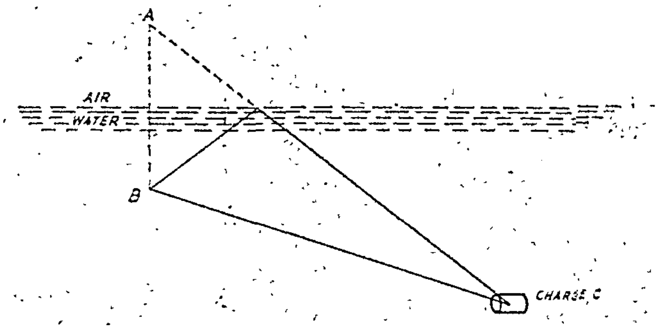

Fig. 3—Reflexion from a free surface (e.g., water-air). Path difference between positive and negative pulse = CA – CB. Tension wave arrives later by interval $\frac{AC - CB}{a}$, where a = velocity of sound in water (5000 ft. per sec.).

It has been found from experiment that the maximum pressure from a charge is approximately proportional to $W/D^{\frac{1}{3}}$ where W = weight of charge and D = distance from centre of charge. This means that if damage to a structure is determined by p-max the range for constant damage will be proportional to $W^{\frac{1}{3}}$.

The energy is proportional to W/D^2 so that if the damage is determined by the energy, then the range for constant damage will be proportional to $W^{\frac{1}{2}}$. As the ∫pdt is proportional to $W/D^{\frac{2}{3}}$, the range, if determined by the time-integral of pressure, will be proportional to $W^{\frac{2}{3}}$.

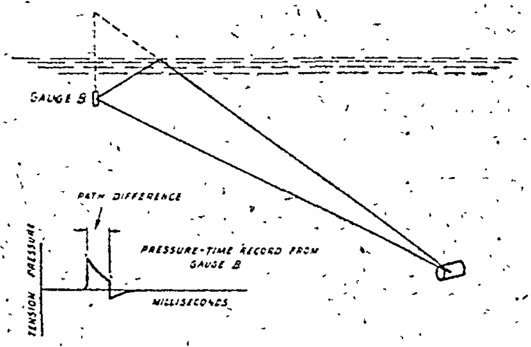

Fig. 4—Direct and reflected pressure-pulses from underwater explosion as recorded in gauge near the surface and not immediately above charge.

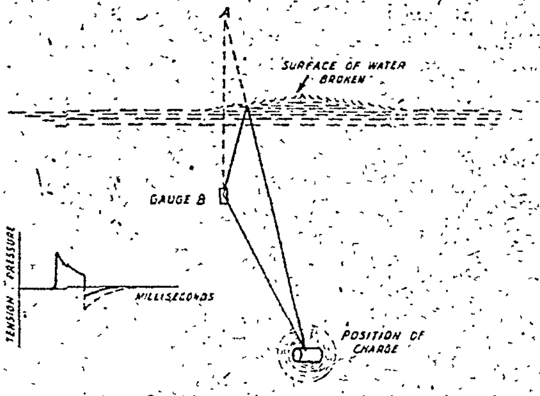

Fig. 5—As in fig. 4 but with gauge nearly above charge.

These scaling laws can be summed up by the statement that distances and time intervals both have to be scaled up as $W^{\frac{1}{3}}$, and that if this is done the pressure remains constant.

It appears from experimental evidence that the damage range is proportional to something between $W^{\frac{1}{3}}$ and $W^{\frac{2}{3}}$, as the results show that it is neither maximum pressure nor the ∫pdt that determines the degree of damage. A high p-max is of little use if not sustained sufficiently long to distort the structure beyond its power of elastic recovery, and a high ∫pdt is of little value if the pressure is less than the structure is able to withstand.

For practical purposes, the effect of the air-water surface is to suppress the latter part of the pressure pulse, and thus to diminish the time-integral of pressure of the impulse, without affecting the maximum pressure (figs. 4 and 5).

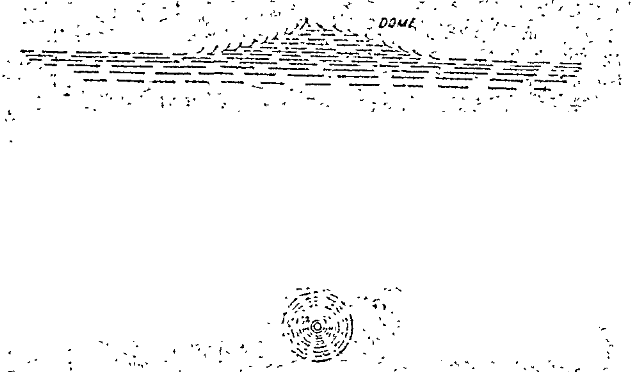

Fig. 7—Appearance immediately after detonation of explosive, showing "dome" and volume of gas which travels up to the surface later.

The maximum pressure occurs at the beginning, and so is not affected by the tension pulse, which arrives slightly later. For moderate depths below the free surface—say up to 10 ft.—it is a sufficiently good approximation to take impulse as proportional to depth (of course, the impulse can never rise above the value for deep water, corresponding to the time-integral of the whole pressure pulse).

EFFECTS OF A DEPTH CHARGE

Let us outline the sequence of events when a depth charge explodes under water. The detonation produces a bubble of gas at a very high pressure of the order of 100,000 atmospheres, the expansion of which compresses the water and sets up a pressure pulse very like an intense sound wave (fig. 7). The reflexion of this at the free surface of the water produces the "cut-off" of the pulse already described. A few seconds later the explosion products, which have formed a bubble many times the original volume of the charge, float upwards and

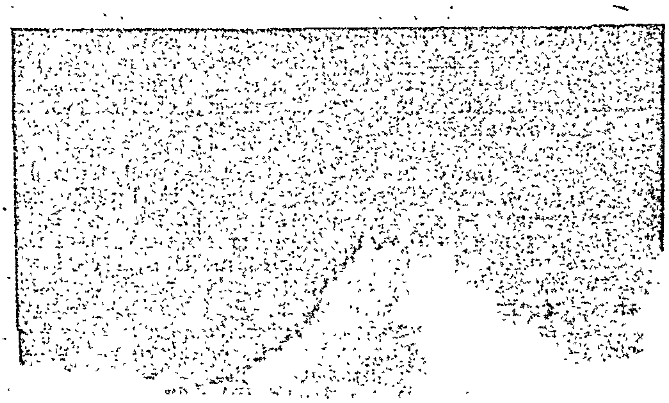

Fig. 6—Advanced stage of "dome."

Fig. 8—The "plume."

break through the surface, any energy still remaining in the bubble being expanded in throwing water upwards (fig. 8) forming the "plume." Although this phenomenon is very spectacular and the water may rise to many hundreds of feet, it has little bearing on damage, which has, except in special cases, all been done by the pressure pulse itself long before the "plume" occurs.

For all except very shallow shots it is possible to distinguish clearly by eye between the regular "dome," occurring almost instantly, and the irregular "plume." For very deep shots the dome disappears, because the incident pressure is not enough to break up the water and the plume is represented by an emulsion of explosion products and water, which rises slowly to the surface. The "dome," while not so spectacular as the "plume," is of more significance owing to the peculiar nature of the reflexion from water to air surface. This has a very important bearing on the damaging effect of an explosion on an object near the surface.

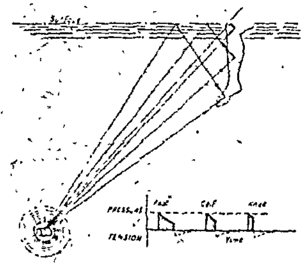

Fig. 9—Action of underwater explosion on dependent leg on the surface.

We can now see the three main effects which will be important, as far as the human body is concerned. First, consider an arm or leg immersed in deep water. Th [illegible] wa [illegible] it, [illegible] only likely consequences are those which follow compression of the nerve-cells—e.g., pain and involuntary movements might occur. Such phenomena as bruising are also possible but unlikely, since it is difficult to burst a cell full of fluid by uniform external pressure.

Next, think of an arm or leg just dipping below the surface (fig. 9). All the wetted part will be subject to the [illegible] action of the surf [illegible] essure will be cut [illegible] are immersed most deeply, so the time-integral of pressure will be longest for the deepest parts (the foot), dropping to practically nothing at the surface itself (the knee). We have now a non-uniform application of pressure which will lead to new effects, among which may be mentioned a greater tendency for the cells to be burst, and a tendency for all the tissues to be squeezed upwards.

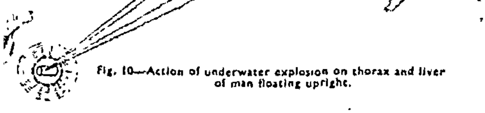

Fig. 10—Action of underwater explosion on thorax and liver of man floating upright.

The third effect is probably far the most important if the whole body is immersed (fig. 10). When a pressure pulse arrives at an air-water boundary it is reflected as a tension pulse and tension is set up in the water. Manifestly a similar effect will occur when the pressure pulse reaches an air cavity such as the pleural or abdominal cavity. The reflexion process will cause stresses in the walls of the cavity, and this wall will, according to its strength and thickness, either be torn apart or displaced bodily inward. It is at such a boundary of the liquid as air that these big displacements can occur. (The bodily motion of a particle of water at a point away from the free surface and 200 ft. from a 300 lb. charge is only about a quarter of an inch.

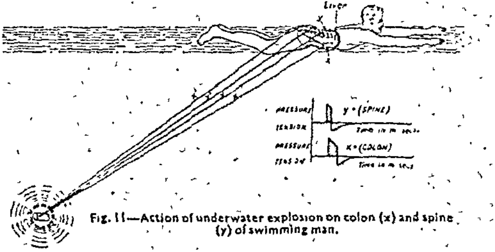

Fig. 11—Action of underwater explosion on colon (x) and spine (y) of swimming man.

PROTECTIVE MEASURES

The best way of protecting a person in the water seems to be by surrounding his vulnerable parts by another air cavity such as a swimming jacket. Such substances as cork or 'Sorbo' would also be of value on account of the air which they contain. It seems necessary to protect the abdomen as well as the chest, since it in any case receives a larger impulse because it is further from the surface of the water than the chest (fig. 10); to protect the chest and not the abdomen may do more harm than good. With or without protective equipment a man would be better off if he is swimming than simply floating upright, for the very act of swimming raises the lower parts of his body in the water (fig. 11).

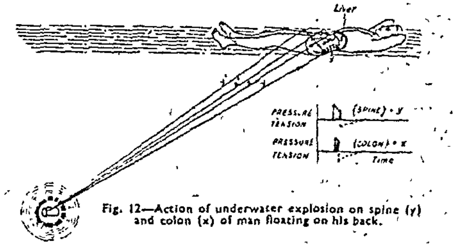

Fig. 12—Action of underwater explosion on spine (y) and colon (x) of man floating on his back.

Thus, the indications appear to be that the protection should reach from neck to hips, and that the person

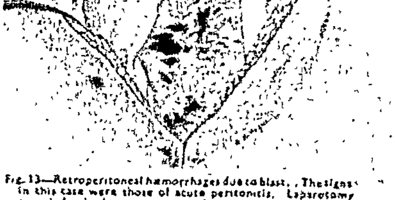

Fig. 13—Retroperitoneal hæmorrhages due to blast. The signs in this case were those of acute peritonitis. Laparotomy revealed only the retroperitoneal hæmorrhages.

should be as nearly as possible in the horizontal position—preferably on his back (see fig. 12). In this position the abdominal viscera are as near the free surface of the water as possible.

These physical facts fit in well with actual clinical observation of cases which have been submitted to underwater explosions. It is the air-containing viscera that are liable to be injured in such explosions. This has been shown by many surgeons during this war.

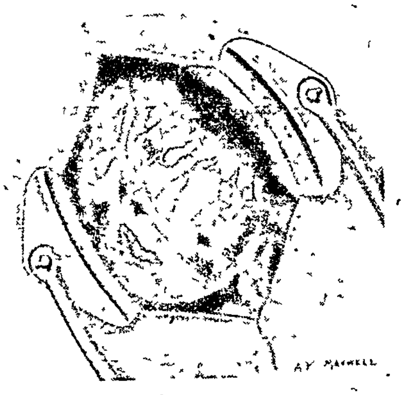

Fig. 14—Blast injury to cæcum.

The abdominal lesions vary from retroperitoneal and subperitoneal hæmorrhages (fig. 13) to perforations of the intestines (fig. 14). As a rule it is the gut in the lower abdomen which is more likely to be injured. Quite often it is the terminal loop of the ileum. The perforation is on the antimesenteric portion of the bowel and there is considerable prolapse of the mucous membrane.

The cæcum is quite commonly ruptured and the perforation occurs on the outer side just lateral to the longitudinal band. The cæcal perforations are similar to those produced in intestinal obstruction due to annular carcinoma of the sigmoid colon. In some cases patients have complained of pain in the right iliac fossa some three or four days after the underwater injury, and on examination a lump has been felt and diagnosed as an appendix abscess. Operation has revealed the true nature of things; the tell-tale retroperitoneal hæmorrhages give the real diagnosis, and the actual perforation has been sealed off by the omentum in some cases.

I wish to thank Surgeon Vice-Admiral Sir Sheldon Dudley, FRS, for his interest and help in the investigations we have carried out during the last four years. Mr. H. C. Wright, B SC, PH D, has given much help in the elucidation of some of the physical phenomena and I extend my grateful thanks for all his help and for the excellent diagrams.

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SYNTHESIS AND DESTRUCTION OF NICOTINIC ACID BY THE MIXED CÆCAL FLORA OF MAN

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THE synthesis of "nicotinamide" by the intestinal flora of man has been strongly suggested by indirect experimentation—i.e., by the observation that the urinary elimination of nicotinamide methochloride dropped sharply after the administration of "sterilising sulphonamides" to human subjects and returned to normal after the drugs were discontinued (Ellinger, Coulson, and Benesch 1944, Ellinger, Benesch, and Kay 1945). It was thought desirable to obtain direct evidence of such synthesis by studying the behaviour of the mixed intestinal organisms, obtained directly from the human bowel. The cæcum was thought to be the most suitable part of the intestinal tract for this purpose, in view of the observations of other workers on the rôle of the cæcum in the vitamin nutrition of the rat (Abdel-Salaam and Leong 1938, Taylor, Pennington, and Thacker 1942).

Material from a patient with a cæcostomy was obtained through the courtesy of Mr. J. Jemson of Lewisham LCC Hospital. The cæcostomy was carried out to relieve obstruction in the distal half of the colon caused by a carcinoma. The sample of the mixed cæcal flora was secured by washing out the cæcum through the cæcostomy with warm tap water. One ml. of the resulting suspension was inoculated into a series of flasks, each containing 150 ml. of 'Bacto-Peptone' (Difco) with 0·5% sodium chloride. Twelve of these flasks were incubated aerobically and twelve anaerobically—by covering the medium with liquid paraffin—at 37° C. Two flasks from each set were removed after 1, 2, 3, 4, 6, and 9 days and the amount of nicotinic acid[*] in the whole culture medium (i.e., the medium plus the bacterial growth) was estimated in duplicate by the method of Wang and Kodicek (1943). Each value therefore represents the average of four separate determinations. To ascertain the original nicotinic acid content of the medium plus inoculum, 150 ml. aliquots of the medium plus 1 ml. of inoculum were analysed immediately after inoculation. The results are shown in the figure.

A qualitative examination of the bacteria in the original cæcal sample was undertaken by Mr. F. Partner, his findings being as follows:

Aerobic.—*B. proteus*; *Alkaligenes fæcalis*; *Bact. coli communis*; *Ps. pyocyanea*; *Enterococcus*; *Staph. albus*.
Anaerobic.—*Cl. welchii*.

On the ninth day of cultivation bacterial counts were carried out to compare the number of organisms present in the culture flasks under aerobic and anaerobic conditions (see table).

TABLE SHOWING NUMBER OF ORGANISMS PER ML. IN THE CULTURE FLASKS 9 DAYS AFTER INOCULATION (2 AEROBIC; 2 ANAEROBIC).

	Aerobic	*Average*	*Anaerobic*	*Average*
(*a*)	$1{\cdot}75 \times 10^8$	$1{\cdot}95 \times 10^8$	$1{\cdot}0 \times 10^9$	$1{\cdot}1 \times 10^9$
(*b*)	$2{\cdot}15 \times 10^8$		$1{\cdot}2 \times 10^9$	

DISCUSSION

From the results shown in the figure it will be seen that considerable synthesis of nicotinic acid occurred under aerobic conditions, amounting to 0·8 mg. per litre. For comparison a curve showing the nicotinic acid synthesis by *B. aerogenes* on a synthetic medium, obtained by Burkholder and McVeigh (1942), is included. It is apparent that the range of values found by these workers is comparable with the ones reported here, although more synthesis took place during the earlier part of their experiment. The absence of a more definite synthesis in the first few days of this experiment may perhaps be explained by one or all of the following facts:

(1) There was an interval of 3 hours between the cæcal washout and the inoculation into the culture medium, which may have had a retarding effect on bacterial growth.

(2) The medium employed in this work contained some nicotinic acid to start with (0·4 microgramme per ml.), unlike the nicotinic-acid-free medium employed by Burkholder and McVeigh. The initial supply of nicotinic acid may have partly obviated the necessity for these bacteria to synthesise the vitamin at the beginning of the growth period.

(3) It has been shown (Topley and Fielden 1922) that in broth cultures of the flora from human fæces there occurs a succession of dominant species, one species replacing another at definite intervals. This may account for the nicotinic acid synthesis curve being almost linear, rather than of the exponential type usually associated with growth curves of a single bacterial species. It is possible, therefore, that the observed linear increase in nicotinic acid from day to day was made up of the contributions of successive species. It is interesting to note that the average nicotinic acid synthesis of the five intestinal bacteria investigated separately on a synthetic medium by Burkholder and McVeigh

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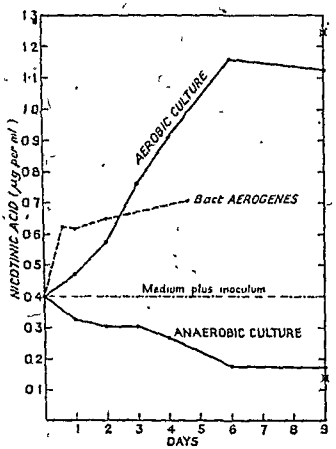
[*] In this paper the substance under discussion has been termed nicotinic acid, since in the assay method employed most derivatives of this compound are converted into nicotinic acid and estimated as such. The actual substance produced and destroyed by the cæcal flora may, however, have been partly or altogether nicotinamide or some similar derivative of nicotinic acid.

amounted to 0·38 µg. in 48 hours, compared with 0·2 µg. in the present experiment.

[illegible] estigations [illegible] developed [illegible] ed about 60% of the vitamin present in the original medium. The drop in the nicotinic acid values cannot be interpreted as an uptake of the substance by the bacteria, since throughout these investigations the whole culture medium, including the organisms, was digested and analysed. It will be seen from the table that there were 5–6 times as many anaerobes as aerobes in the cultures, so the absence of any synthesis in the anaerobic cultures could certainly not have been due to a scantier growth under these conditions. The predominance of anaerobes over aerobes among the intestinal flora agrees well with the results of several investigations on this subject (Eggerth and Gagnon 1933, Weiss and Rettger 1037, Misra 1938).



Synthesis and Destruction of Nicotinic Acid by Cæcal Organisms.

The values represented by the sign on the border of the chart are the result of a microbiological assay (Barton-Wright 1944) carried out independently by Mr. McLeod of the Glaxo Laboratories, Ltd.

A possible criticism of these results is that no real anaerobiasis can be secured simply by the use of liquid paraffin. This is, however, mitigated by the fact that both *B. proteus* and *Ps. pyocyanea* were present among the flora. T[illegible] ll known as avid oxygen [illegible] ed for the production of [illegible] bacteriology.

With regard to bacterial destruction of nicotinic acid, it has been shown that some strains of soil bacteria can produce enzymes which specifically destroy this compound (Allinson 1913). Considerable destruction of vitamin B_1 in the human digestive tract has recently been claimed to occur by Williamson and Parsons (1915). These workers found that 5 out of the 25 subjects on whom aneurine-balance experiments were carried out consistently showed an extremely low fæcal elimination of this vitamin, even when fresh yeast was fed. It is therefore concluded that some special condition exists in the digestive tract of these persons which results in this particular effect, and that the destruction of the aneurine may be due to the action of micro-organisms.

It has also been shown by Young and Rettger (1913) that a large variety of enteric bacteria decompose vitamin C rapidly and completely. From their investigations it is apparent that the conditions under which bacterial decomposition of ascorbic acid proceeds are similar to those which accompany nicotinic acid [illegible] by the present work. Thus [illegible] to be destroyed anaerobically [illegible] anced by the presence of an [illegible] organic nitrogen, such as peptone.

The present findings throw an interesting light on the [illegible] by the host organism and its [illegible] It seems that normally there [illegible] gical system in which aerobic and anaerobic organisms live together, with the result that an equilibrium is constantly struck between the activities of the organisms producing and destroying nicotinic acid. This equilibrium has corresponding repercussions on the net amount of vitamin available to the host organism. In view of these results it seems reasonable to suggest that much of the "interference with absorption" of water-soluble vitamins, often blamed for the development of deficiency diseases and tacitly assumed to be due to an improperly functioning intestinal mucosa, is in fact partly due to actual destruction of the vitamin in the gut under certain conditions.

The findings also have an important bearing on the interpretation of the experiments of Ellin[illegible] and [illegible] sharp [illegible] elimination, observed in subjects receiving succinylsulphathiazole, may have been caused by a shifting of the equilibrium between the nicotinic-acid-producing and -destroying organisms in favour of the latter, since it is well known that both sulphonamide-sensitive and sulphonamide-resistant strains are present among the intestinal flora. Thus Najjar and others (1911), who demonstrated that intestinal biosynthesis of riboflavine is not affected by the administration of succinylsulphathiazole, concluded that riboflavine was synthesised by sulphonamide-resistant bacteria.

Further work is obviously necessary to confirm the present findings and to obtain more detailed information on the subject. A study of the vitamin metabolism of single intestinal species would, however, seem to be of [illegible] haviour of [illegible] coaching as [illegible] the bowel. [illegible] plan of the present [illegible] odification that at regular [illegible] to the times of the vitamin estimations—the dominant species in the mixed flora is determined by the methods developed by Topley and Fielden (1922). In this way it should be possible to correlate the presence of certain dominant species with the rate of vitamin production or destruction.

SUMMARY

Human fæces obtained from a cæcostomy was cultivated aerobically and anaerobically, the nicotinic-acid content of medium plus culture being estimated at intervals for nine days.

Under aerobic conditions a considerable synthesis of nicotinic acid took place, mainly after the third day of cultivation.

Under anaerobic conditions the cæcal organisms destroyed two-thirds of the nicotinic acid present in the original medium.

It is suggested that in the normal cæcum an equilibrium [illegible] oduce and [illegible] ect in this [illegible] deficiency [illegible]

I am indebted to Mr. F. A. Ibbott for his capable assistance and to Dr. W. W. Kay for his interest in this investigation.

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PNEUMOCOCCUS IN THE TROPICS.—In a year's experience on a US naval hospital ship in the South Pacific the pneumococcus was a strikingly uncommon cause of trouble. Only 24 men with pneumonia were admitted during the year, out of 9085 admissions, and out of 272 cultures made from the nasopharynx in cases of upper respiratory infection only 7 grew a pneumococcus. This organism is apparently unable to survive for long periods in a tropical climate. (Norris, R. F. *Med. Clin. N. Amer.* December, 1944, p. 1415).

AGAR FOR LOCAL PENICILLIN THERAPY

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PENICILLIN for local treatment has usually been applied either as a solution in water or saline, or as a cream in a lanette wax or stearate base (Barron et al. 1944, Taylor and Hughes 1944); both these vehicles have disadvantages. Solutions exert their maximum effect immediately after application; from a raw surface they may be absorbed, and if this happens local action will cease. Ointments and creams are greasy and readily contaminated, and they do not allow good diffusion of penicillin, as Selbie and his colleagues (1945) have also shown. One of us (R. B. C.) thought agar would be a good vehicle for penicillin, and preliminary trial showed that 0 5% concentration gave the desired consistency. The name 'Penagar' was given to the penicillin in agar; the control vehicle of 0·5% agar without penicillin was called 'Blancagar.'

PREPARATION

Base.—1% powdered agar was added to freshly distilled water, steamed to melt, and the agar filtered through paper. Volumes of 50 and 100 ml. were bottled and sterilised at 15 lb. for 20 minutes. If an isotonic preparation was wanted 1·7% NaCl was added.

Penicillin solution.—A concentration twice that required in the finished product was made up in sterile distilled water. If this solution had been refrigerated it was warmed to 37° C before mixing with the base.

Penagar.—The base, melted in boiling water, was cooled to 55° C, when 50 ml. was pipetted into a wide test-tube (8 × 1½ in.); an equal volume of the penicillin solution was added; the contents were then mixed and immediately pipetted in the required volumes into sterile screw-capped bottles of convenient size.

Blancagar.—The control preparation was made in the same way, but distilled water, in place of the penicillin solution, was added to the base.

EXPERIMENTAL

Diffusion of penicillin through agar.—Experiments were made to compare the diffusion of penicillin through agar, lanette wax base, and ammonium stearate base. Porcelain cylinders were half-filled with wax or stearate base, the under surface smoothed off with sterile lint, and the cylinders placed on plates sown with Heatley's strain of *Staphylococcus pyogenes*. Other cylinders were sealed on to the medium and blancagar pipetted into the lower half of the cylinder. Three drops of penicillin solution were pipetted on to the surface of all the bases and into an empty cylinder. The plates were incubated and the diameter of each inhibition zone was measured next day; the results of two experiments are shown in table I.

The experiments confirmed that penicillin diffused readily through agar and showed that there was much less diffusion through the lanette wax and stearate bases.

Stability of penicillin in agar.—Penagar could be pipetted and reasonably accurate dilutions made for assay. Using a modified Oxford plate method (16 plates per assay) it was found that after storage in the refrigerator for 3 and 7 weeks the penagar assayed at 80% and 55% of the original penicillin content. The experiments were made in May and June, 1944, with relatively impure penicillin; with more recent products there is no doubt that the stability would be greater.

USE OF PENAGAR

Penagar was dispensed as "one dose per bottle" and the contents were spread on sterile lint cut to the size and shape of the area to be treated; a 10% excess was placed in each bottle to allow for some of the jelly being retained. Penagar was applied twice a day.

Skin infections.—Penagar, made up to contain 100 units per ml., was compared with solutions (200 units per ml.) and cream (200 units per g.) used on similar cases. Swabs were taken daily and at least three colonies were picked from each plate and tested qualitatively for penicillin sensitivity. The slide-coagulase test (Cadness-Graves et al. 1943) was used for staphylococci.

Some improvement in the clinical condition was often produced by blancagar—though the bacterial flora [illegible] patients were treated with this [illegible] ame stationary; penagar was then started. [illegible] the effect of penagar became appare[illegible] rs later and was shown by a reduction in the number of colonies growing from the swab. Scanty growths (occasionally no growth developed) persisted for several days, but if the lesion had not healed after 10–14 days' treatment the number of colonies again increased. The organisms growing at this stage often showed increased resistance to penicillin, but from one swab all organisms of the same species (usually staphylococci) were not equally affected—some might be resistant, others sensitive. Clinically the effect of penagar was no better—and no worse—than any other method of applying penicillin to these skin infections (impetigo, sycosis barbæ, and infective dermatitis). Initially they showed fairly rapid improvement but either failed to heal completely or relapsed later. Failure was often attributable to an underlying constitutional condition such as seborrhœa, or to reinfection of the affected areas from a septic focus elsewhere. Uncomplicated cases did well.

TABLE I—HALO OF INHIBITION PRODUCED BY PENICILLIN DIFFUSING THROUGH DIFFERENT BASES

Expt	Plate	Base	Penicillin (units per ml.)	Halo diameter(mm.)
1	A	Blancagar	1·5	10
		None	1·5	21
	B	Lanette wax	1 5	0
		None	1·5	23
2	C	Ammonium stearate	0	0
		„ „	2	0
		„ „	5	0
		„ „	50	13
		Blancagar	0	0
		„	2	16
		„	5	18
		„	50	27
		None	2	18
		„	5	23

Infected superficial wounds.—A concentration of 500 units per ml. was used in the treatment of this type of infection. If the organisms were penicillin-sensitive, wounds were quickly sterilised and healing was rapid.

Gonorrhœa.—It seemed likely that penagar might be suitable for slow absorption of penicillin from the tissues, and animal experiments were made to determine what effects the agar itself would produce. Guineapigs were inoculated with blancagar in doses of 1 ml. intramuscularly (i.m.) and subcutaneously (s.c.) and were killed 1, 2, and 4 weeks later. Injections of 1 ml., i.m. and s.c., into sites not previously inoculated were made just before death; these served as controls and showed the immediate effects of the inoculation.

A week after the subcutaneous inoculation, a small indurated nodule could be felt; this gradually became smaller and could not be felt at 4 weeks. Sections showed no immediate reaction; after 7 days there was a collection of mononuclear cells around a small unstained central mass (thought to be agar); at 14 days there were more mononuclear cells and some of these resembled giant cells.

After intramuscular inoculation there was a swelling of the tissue, and a week later a small nodule could be felt, but in the animals killed after a fortnight the precise site of inoculation was difficult to localise even when the muscle was exposed at necropsy. The inoculations produced an immediate separation of the muscle-fibres; a week later this was less and there was a mononuclear reaction; after 2 and 4 weeks there was a greater cellular reaction but less muscular disturbance. The reactions were typically those to a foreign body.

Since blancagar appeared to be innocuous to guineapigs, a man with sulphonamide-resistant gonorrhœa

was treated with penagar; two doses, each of 50,000 units in 1 ml. of penagar, were inoculated intramuscu-
.0 AM and 3.5 PM. The
and urine are shown in
re made by Heatley's
serially in broth, which was then inoculated with *Staph. pyogenes*. After inoculation of penagar the serum bacteriostatic titre showed a rapid rise followed by a fall which hardly differed from that following a single i.m. inoculation of an aqueous solution (Fleming et al. 1944, McAdam et al. 1944). Clinically and bacteriologically the response was good; gonococci, numerous in smears before treatment started, were absent 9 hours later. Next day, on being questioned, the patient complained of slight pain in his buttock.

Possible uses of penagar.—Small collapsible metal tubes containing penagar might be useful in preventing wound infection; the contents could be applied before the first field dressing. If penagar were of adequate strength and packed in a collapsible tube fitted with a nozzle, urethral instillation by the patient might afford protection against both the gonococcus and *Treponema pallidum.*

DISCUSSION

"Penicillin agar," the medium on which *Penicillium notatum* had grown, w
and Murphy (1944) to
Such a preparation su
the penicillin content is necessarily small; that of penagar can be controlled.

Selbie and his colleagues think
satisfactory vehicle for the loca
cillin is a pressing need, for oily
too slowly. We think that penagar fills this need—it is clean to use, it does not soil clothes or dressings, and, unlike pectin, it is not sticky. It is easy to prepare and is stable at refrigerator temperature. As a local application, penagar appeared to be as efficacious as any other preparation of penicillin; it had the advantage that each dose could be presented in a sterile container. Solutions of penicillin have all these advantages but their application requires some form of nebuliser, which is not easy to sterilise. Ointments and creams are greasy and readily contaminated, and, as Selbie and his colleagues (1945) have shown, they do not allow good diffusion of penicillin. For intramuscular inoculation penagar has no advantage over solutions, and it cannot be recommended for this purpose because it leaves a foreign body in the tissues.

TABLE II—MAXIMUM SERUM AND URINE DILUTIONS PRODUCING BACTERIOSTASIS

Time	Time since inoculation	Serum	Urine
10.00 AM	First inoculation	..	..
10.15 "	15 minutes	1:32	..
10.30 "	30 "	1:16	..
11.00 "	1 hour	1:4	..
11.30 "	1 " 30 minutes	..	1:1280
12.00 NOON	2 hours	1:1	..
1.00 PM	3 "	0	1:100
2.00 "	4 "	0	..
3.00 "	5 "	0	..
3.05 "	Second inoculation	..	..
3.20 "	15 minutes	1:64	..
3.35 "	30 "	1:8	..
4.05 "	1 hour	1:8	..
5.05 "	2 hours	1:2	1:800
6.00 "	2 " 55 minutes	0	..
7.00 "	3 " 55 "	0	1:400

.. = no test.

SUMMARY

Penagar is penicillin in semi-solid agar; its preparation, which is simple, is described. The penicillin remains active for at least a month at refrigerator temperature and diffuses readily from the agar when applied to the tissues. Penagar is clean to use and non-sticky, and can be packed in sterile bottles or collapsible tubes, each containing one dose. Its use as a primary application for wounds and as a urethral instillation is suggested.

This paper is a summary of a report to the Director of Pathology, War Office, and we have to thank Major-General

Continued at foot of next column

Continued from previous column

L. T. Poole and Colonel F. R. Laing, officer commanding a military hospital, for permission to publish. We are also grateful to Miss S. Glasscock, Sgt. F. Page, and Pte. G. Littlewood for their help.

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EOSINOPHILIA WITH CHRONIC PERITONITIS

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THE causes of eosinophilia have been enumerated in a *Lancet* (1943) commentary on Weingarten's (1943) paper on tropical eosinophilia. Two diseases were omitted from the list, tuberculosis and periarteritis nodosa, both of which are occasionally associated with a high eosinophil count.

Little has been published in this country on eosinophilia in tuberculosis (Gill 1940). Some textbooks of hæmatology (e.g., Whitby and Britton 1939) refer vaguely to it, but emphasise that the usual white-cell reaction to tuberculosis is, in the acute stages, a neutrophil preponderance with leucopenia or a mild leucocytosis, and a monocytic or lymphocytic predominance as the disease heals.

In Europe and South America
described
glands, as
Mention is made by Gill of a number of the papers concerned. He goes on to describe the case of a lad of 19 who had had colicky upper abdominal pain for two months, the spasms lasting a few minutes and occurring several times a day. The patient later developed a cough and pain in the chest. He proved to have tuberculous peritonitis and a pleural effusion which contained 80% of eosinophils. His white cells numbered 9200 per c.mm., and of these 14% were eosinophils.

Periarteritis nodosa, on the other hand, is widely recognised in this country as a cause of eosinophilia, and high figures have been recorded—i.e., 77% of 20,000 white cells (Handley and Martin), and 55–65% of 31,000–33,000 (Grant 1940). Grant (1940) shows that it is the amazing variety of symptoms and signs which at once gives periarteritis nodosa its characteristic features and makes it so difficult to diagnose.

> "A complete list of the symptoms of the established disease would cover almost the whole field of medicine, as would also a list of the diagnoses made before the nature of the condition was recognised."
>
> "In fact it is difficult to find any two cases with the same course among those hitherto reported, about 350 in all."

It ca
inite diagnosis was
reached
below; the picture
was of
eosinophilia. The
two illn
similar, and the train of symptoms was not unlike that of Gill's case. It would be rash to say that the clinical manifestations could not have been caused by periarteritis—indeed many of the symptoms could be accounted for admirably by that disease—but the second sentence quoted from Grant, together with certain features which will be mentioned later, make the differential diagnosis interesting.

CASE-HISTORIES

CASE 1.—A labourer, aged 29, was admitted to the General Hospital, Birmingham, on July 18, 1931. Eight months previously he had had a febrile cold and bronchitis, which had been followed by a series of mild attacks of asthma. He had had night sweats, and had lost appetite and weight. For a month before admission he had been troubled by spasms of epigastric pain, which were sharp, quite unrelated

TABLE SHOWING BLOOD-COUNTS

	CASE 1						CASE 2				
	July 20	July 27	Aug. 4	Aug. 11	Aug. 25	Sept. 1	Oct. 19	Oct. 21	Nov. 5	Nov. 9	Nov. 11
Red cells per c.mm. ..	4,000,000	..	4,590,000	4,690,000	4,100,000	4,070,000	4,420,000	..	4,430,000	4,230,000	..
Hb. %	68	..	72	65	63	63	76	..	80	80	..
White cells per c.mm.	32,600	19,040	29,200	27,600	13,100	20,600	31,000	32,000	23,800	25,800	25,800
Differential count (%):											
Lymphocytes ..	11·2	10·8	9·0	5·6	15·0	16·0	..	15·0	11·0	23·5	20·0
Polymorphs:											
Neutrophils ..	24·2	37·2	38·2	42·4	41·6	53·6	..	22·0	25·0	24·0	28·0
Eosinophils ..	62·0	49·2	48·4	46·6	39·6	28·2	..	62·0	61·0	48·5	49·0
Basophils ..	0·2	0·6	0·8	0·2	0·4	0·8	..	1·0	..	1·5	1·0
Monocytes	2·4	2·2	3·6	5·2	3·4	1·4	..	..	..	1·5	..
Myelocytes ..	..	..	..	0·2	..	..	..	..	..	0·5	..
Turck cells.. ..	..	..	..	..	..	..	..	..	..	0·5	..

to meals, and radiated to the right groin. On July 15 a rash developed. Past and family history were irrelevant.

He was well built, but had recently lost weight. Generalised petechial rash. Tonsils enlarged and injected: no enlargement of lymph-glands. Signs of mild asthmatic bronchitis. Pulse regular, vessels normal, blood-pressure 115/78 mm. Hg. Heart a little enlarged, but heart sounds normal. *Slight tenderness in epigastrium, liver just palpable* and tender, spleen not felt. Temperature ranged between 98° and 99° F while he was in hospital.

Urine: a few red cells and a trace of albumin. Wassermann reaction negative. Hydatid complement-fixation test positive, both with control and with patient. Casoni skin test negative. Radiography of chest showed general enlargement of heart and diffuse mottling of both lungs, suggestive of miliary tuberculosis. No tubercle bacilli found in sputum or urine. Blood-counts are shown in the table.

Laparotomy was carried out for persistent abdominal discomfort on August 21. Liver, spleen, and both kidneys were enlarged. The peritoneum was studded with pinkish-white miliary tubercles. After recovering satisfactorily from the operation he suddenly collapsed and died on Oct. 6.

At autopsy, the body was emaciated, with petechial rash on arms. Pleuræ normal; lungs emphysematous and containing numerous small infarcts; no evidence of tuberculosis. Heart hypertrophied, with normal valves; terminal pericarditis. Generalised miliary tuberculosis of peritoneum; gut normal; spleen and liver enlarged and congested; kidneys large and scarred, with numerous small infarcts. Thrombus in left renal artery. Lymph-glands normal. Bone-marrow (right femur) gelatinous, with erythroblastic reaction at upper end; bone shaft thicker and denser than normal. No evidence of leukæmia.

Material taken for section was unfortunately lost in transit to the laboratory and consequently no microscopical examination was made. Tuberculosis was the suggested cause of death.

CASE 2.—A woman, aged 43, was admitted to an Emergency Hospital on Oct. 15, 1942. She had had mild attacks of asthma for some years, and had felt vaguely unwell for a year. At the beginning of September she became severely constipated, and complained for a few days of pains in the back, especially in the lumbar region, which were attributed by a surgeon to bad posture. A week later she began to have spasms of epigastric pain which radiated downwards towards the umbilicus. The pain bore no consistent relation to food; it was severe and colicky. She vomited once. At the beginning of October the constipation gave place to diarrhœa, and she passed frequent fluid motions which contained neither blood nor mucus. Her appetite failed, and she lost 2 st. in weight in two months. No swelling of the eyelids. Past and family history irrelevant.

On admission she was pale, but had no rash or subungual splinter hæmorrhages; no muscular tenderness. Mild dental caries. A few small cervical glands disappeared in the course of a few days. Lungs, heart, and peripheral vessels normal. Abdomen tumid and doughy; free fluid present, no organs felt. Temperature was normal throughout illness, pulse 80–100 per min.

Urine: a trace of albumin but no deposit. Antigen for Casoni skin test could not be obtained. X-ray films of chest and long bones normal; barium enema suggestive of ulcerative colitis; no calcified trichinella cysts seen in muscles. Stools contained no pus, red cells, mucus, protozoa, cysts, ova, or abnormal organisms, but the benzidine reaction was positive on two occasions. Sigmoidoscopy normal on Oct. 15, but on Nov. 18 Mr. L. E. Jones reported: "mucous membrane œdematous, vessels not visible. Bleeds more easily than normal. Areas of hyperæmia a few millimetres in diameter, no ulceration; liquid fæces. Suggests early ulcerative colitis." Blood-counts are shown in the table.

She was never acutely ill while in hospital and the diarrhœa was never pronounced; she passed only two semi-formed stools each day. Her abdomen remained distended, and several physicians agreed that she probably had tuberculous peritonitis. Exploratory laparotomy was considered, but rejected as unlikely to benefit the patient. She was discharged on Nov. 28, slightly improved, and remained in fair health until Dec. 18 when she suddenly had severe headache. Her doctor found her lacrimose and uncooperative; subarachnoid hæmorrhage was suspected, but lumbar puncture was not attempted. Her condition became rapidly worse; she developed strabismus, lapsed into coma, and died next day, before she could be admitted to hospital.

Unfortunately it was not possible to obtain a post-mortem examination, and the cause of her sudden death must therefore remain conjectural. Tuberculous meningitis is unlikely in view of the rapid course. A vascular catastrophe similar to those affecting the kidneys and lungs of the first patient might have predisposed to a subarachnoid hæmorrhage.

DISCUSSION

The remarkable similarity between the two cases is evident, the story and appearance of the second immediately reminding me of the first. Neither patient had been abroad; both had a history of mild asthmatic attacks, severe spasmodic epigastric pain, unrelated to meals but accompanied by anorexia and loss of weight (*cf.* Gill's case). The blood-counts are extraordinarily alike, with a mild hypochromic anæmia and a very high relative and absolute eosinophilia, but no immature cells. Both patients had slight albuminuria and both were thought to have tuberculous peritonitis.

All the usual causes of eosinophilia were considered. The slight asthma and early ulcerative colitis were insufficient to account for the findings. Nothing in the histories or physical signs suggested trichiniasis, except perhaps the short episode of lumbar rheumatism in the second case. Hydatid disease was definitely ruled out in the one, and was unlikely in the other, since no cysts could be demonstrated either by clinical or X-ray examination. There was certainly no parasitic infestation of the alimentary tract, and no evidence of lymphadenoma. Lack of immature cells may not exclude leukæmia, but this is improbable because of the steady decrease in leucocytes during the illnesses, the mild and non-progressive anæmia, and the lack of marrow infiltration and material splenic enlargement.

The differential diagnosis therefore appears to rest between tuberculosis and periarteritis nodosa. Asthma, albuminuria, abdominal pain, anorexia, and loss of weight are fairly common in both diseases. While an absolute blood eosinophilia of 20,000 is unusual in periarteritis it has probably never been described in tuberculosis. Indeed the lack of papers on the subject suggests that, in this country, a blood eosinophil reaction rarely accompanies tuberculosis. (Eosinophilia in the pleural fluid may be commoner, for I have recently seen an airman, aged 40, who had a clear, straw-coloured effusion containing 50% eosinophil cells. His pulmonary tuberculosis responded satisfactorily to treatment.)

Periarteritis nodosa, which often involves the mesenteric vessels, could no doubt so closely simulate peritoneal tuberculosis as to deceive the most elect of surgeons or pathologists unless microscopical sections were examined. The widespread infarcts in the first patient certainly suggest periarteritis,[1] and a subarachnoid hæmorrhage from a diseased vessel might well account for the sudden fate of the other case, although it should be pointed out that Grant considers meningeal symptoms extremely unusual.

It is the similarity of the case-histories which is so *disturbing*, and makes me [illegible] in favour of periarteritis. [illegible] on many occasions, for s[illegible] always unsuccessful. The lack of fever and the very moderate anæmia are additional points against this diagnosis.

SUMMARY

Two cases are described with a high eosinophilia and chronic peritonitis. The possibility that tuberculosis was responsible is discussed, and attention is again drawn to the lack of English reports of eosinophilia in tuberculosis.

I am indebted to Prof. K. D. Wilkinson for permission to publish the first case.

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Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the section of medicine on May 29, with Dr. GEOFFREY EVANS, the president, in the chair, a discussion on

Protein Hydrolysates

was opened by Dr. H. E. MAGEE. In the terminal stages of starvation, he said, copious and persistent diarrhœa, not responding to treatment, is usually the forerunner of death. Before 1933 he worked for several years on the physiology of absorption, and found that as fasting continues there is progressive diminution in the absorptive powers and protective functions of the intestinal mucosa. Metabolic processes are also impaired. Thus in rats fasted for 24 hours absorption is 30% lower, and the contractions of the intestinal villi are slower and less efficient than in animals not fasted at all. In fasting fowls, too, the rate of absorption is slowed, and the hyperglycæmic curve after a dose of glucose is lower than the curve in unstarved fowls. Greek workers found that in starving humans, on the contrary, the curve was not lower, but that it was prolonged considerably, showing that metabolism is disturbed. The columnar epithelium is progressively disorganised by fasting, and the height of the cells is reduced. The staining properties are impaired and at last the villi disappear, and the columnar epithelium shrinks so much that only the basal membrane seems to be left. Careful feeding leads to gradual reconstitution of the mucou[illegible]

In starvati[illegible] *lesion is in* the intestine, [illegible] structurally and functionally. The shrinkage of the epithelium exposes the intestine to irritation by undigested foods, and diarrhœa follows. Parenteral feeding should therefore be the aim, and sufficient amino-acids should be injected to reconstruct the intestinal mucosa. These amino-acids should be used by the body as building materials, but in the starving patient they are apt to be broken down and used for energy. To protect them it is necessary to give glucose, and also B vitamins, which enable the body to metabolise glucose. Elman has used injections of protein hydrolysates successfully in the USA, and some prisoners-of-war returning to this country have responded well to hydrolysates.

Dr. Magee mentioned the experience of doctors in the Channel Islands, which he had lately visited. They found that, as diet there became coarser and more fibrous, appetite diminished, and people developed spasmodic diarrhœa. Œdema came later, and diarrhœa and vomiting might become so persistent that the patient was forced to take to his bed. In the early stages of food shortage they noticed an increase in peptic ulcer perforations, but later the incidence fell off again, and was followed by an increase in the incidence of intestinal obstruction. At autopsy such cases showed spasm of the gut, usually the large but sometimes the small intestine, with ballooning above the obstruction and thinning of the intestinal wall and shrinkage of the mucosa. The incidence of appendicitis fell. Since liberation most of the islanders are suffering from constipation, and [illegible] been sent to their reli[illegible] bread of freedom is th[illegible] since it has replaced the coarse wholemeal bread which they had during the occupation. The freedom bread was received with mixed feelings by the population and is regarded with strong disfavour by the whole medical profession of the Islands who express a preference for a bread midway between the present white and the former coarse wholemeal.

HYDROLYSATES AND ALTERNATIVES

Dr. D. P. CUTHBERTSON said that when the body is deprived of all food it gets 13% of its energy from protein *and 87% from fat. Thus fat and protein are used up in* the proportion of 3 to 1, and survival will depend on the size of the fat depots. It is therefore important to give the starving person enough protein, possibly in the form of its constituent amino-acids. We do not know how enzymes, which have a high protein content, are affected during starvation, nor whether they are preferentially retained. Even in the advanced stages of starvation it is possible to get patients to sip proteinaceous fluids and glucose solution, and to get some synthesis. He quoted the work of Henriques and Anderson in 1913; they injected goats intravenously with glucose and an enzymic digest of goat's flesh, and managed to keep them in nitrogen balance.

Three methods are at present available for preparing protein hydrolysates: (1) digestion with the proteolytic enzyme of pork pancreas at pH 8 and at 37° C; (2) digestion with papain obtained from the melon tree, at pH 5 and 50° C; and (3) the action of sulphuric acid. The first two yield both polypeptides and amino-acids: the third gives amino-acids only, and tryptophan is lost. Casein hydrolysed by method 1 yields amino-acids in proportions almost identical with those of amino-acids in an ordinary American diet. It is, however, extremely unpalatable.

The Medical Research Council drew up a table of suggested treatment by intravenous hydrolysate or plasma or serum, and sent out units ready packed, containing all the necessary materials, for 3 treatments with directions. They also sent units containing materials for 10 complete treatments with oral hydrolysate. Gavage had to be given up in the camps, he said, because the patients thought it was a new form of torture.

Dr. H. S. STANNUS remarked that hydrolysates have sprung rather suddenly into prominence, and are in danger of being regarded as a panacea. With emaciation there is loss of protein from the tissues, and to give protein hydrolysate is only one way of making it good. Protein is essential for protoplasm, nuclei, tissue fluids, *enzymes, hormones, and antibodies. Some 30 amino-*acids have been isolated and about 10 are essential to human needs. The actual number of proteins is very large and each animal elaborates its own; about 1000 have been estimated in the human body. Cells absorb amino-acids from the blood-stream in the proportions in which they require them; unless glucose is available some part of the amino-acids is deaminated to provide it, so it is necessary to give glucose to protect the amino-acids. A pronounced loss of tissue protein may be reflected in a loss of only about one-eighth of the plasma protein.[1] If plasma protein is replaced it does not follow that tissue protein is at once restored; experiment shows that tissue protein is put back at the rate of only about 25 grammes a day. In theory, if the patient can swallow and digest, his protein loss can be made good by giving him skim-milk by mouth; if he cannot swallow but can digest, he can be fed by nasal drip; and if he can do neither he needs intravenous feeding. Dr. Stannus had recently seen a starving man, thought to be moribund, at a time when no hydrolysate was available.

Besides being dehydrated, emaciated, and incapable of moving, the man had a Flexner infection which had not responded to sulphaguanidine—or, if it had, the diarrhœa persisted. Blood and plasma transfusions had no effect. The patient was given glucose-saline drip and crude liver extract parenterally, and within 24 hours was all smiles, claiming to feel perfectly well. A second case a few days later responded to the same treatment in the same way.

EXPERIENCE AT BELSEN

Dr. JANET VAUGHAN described the experiences of a small MRC team which arrived at a concentration camp 14 days after its liberation. She paid tribute to the brilliant and courageous work of the small English medical team whom they found already on the scene. The task of the MRC team was to decide whether hydrolysates worked, and whether it was practicable to give them. Under the conditions of the camps the answer in both cases was no. For intravenous treatment they used 'Amigen,' acid hydrolysate, concentrated normal serum, and twice-concentrated serum. By mouth they gave oral hydrolysate and milk mixture. Laboratory conditions were good, hospital conditions primitive. The patients lay on wooden beds with straw palliasses, in a German barracks which had been taken over in a state of filth. There were two cold taps, which did not always run, on each floor, and for a week after her arrival there was no artificial light except from candles. By day nursing was done by the less-ill women of the camp, by two orderlies, and by members of the Hungarian army working under one English sister. The food came from central kitchens, where it was prepared by Hungarian soldiers under one Red Cross sister for each kitchen. There was no common language, so the doctors could not explain that their intentions were good. The patients cried out at the sight of the simplest apparatus, especially at a syringe, which they knew as the prelude to death. This did not facilitate intravenous therapy.

The team chose emaciated men who were too weak to get off the stretcher, and they tried to avoid typhus and tuberculosis cases. Dysentery cases could not be excluded because all the patients had diarrhœa. They tried to choose patients with gross œdema who were clearly going down-hill. They found that after treatment the plasma protein fell because the plasma was diluted when dehydration was overcome. In 10 patients with gross œdema the mean plasma protein was 3·84 g., and the albumin 2·09 g., per 100 c.cm. In 14 with slight œdema the mean protein was 4·99 g., and the albumin 2·79 g., per 100 c.cm. The hæmoglobin was higher than might have been expected—an average of 66·5% in 21 men. Of 5 patients given amigen intravenously 4 did well; one with severe œdema showed no improvement. Of 3 given intravenous hydrolysate, 2 did not improve, and the third got much worse in a period of 2½ days; he was then given 2 litres of twice-concentrated serum in 24 hours, and improved greatly. Three other patients given serum also did very well.

Dr. Vaughan thought serum preferable to hydrolysate in that it allowed more protein to be given with relatively little fluid; too much fluid increases ascites and œdema. If patients are given 1 litre of serum intravenously, and what fluids they want to take by mouth, they get as much as they need. With hydrolysate the reaction rate is so high that it is not possible to inject enough to bring the patient into nitrogen balance. Hydrolysates given by mouth are so unpleasant that most patients seemed to prefer to die rather than to go on taking them. Some vomited; 2 took all they were given with serious clinical results. One of these, a thoroughly cooperative patient with no diarrhœa, passed half a bucket of watery diarrhœa after oral hydrolysate and had severe colic. It could not be given by gavage because of the dread of torture; besides, a nasal tube is difficult to pass on a patient with a dried atrophic nasal mucosa.

Patients given dried skim-milk and glucose mixtures in small frequent doses did extremely well. They took the milk eagerly, but many of them had sore mouths, and after a day or two it was evident that some flavouring was needed to help them to get it down. Tea and coffee were used, but other flavouring agents, such as vanilla and strawberry, naturally suggested themselves, and are now being considered. Starving people crave food and crave the familiar. They know milk, and they are ready to take it; and it is better to set the few nurses to giving them small frequent feeds than to set up drips which need constant watching and attention, especially when working with patients whose veins are collapsed and small. She realised that she was speaking only for the conditions under which the team has had to work: hydrolysates, she said, may none the less have a great part to play in the medicine of the future.

Captain J. A. F. STEVENSON described studies of nitrogen balance made at Magill University. There is known to be increased excretion of nitrogen in the urine immediately after fractures and burns. About two months after such injuries there is a period of reduced nitrogen excretion, when the body makes good its loss. Extra protein given to patients by mouth immediately after burns or fractures does not influence the nitrogen balance, merely augmenti [illegible] Attempts were made to bring such [illegible] en balanc by giving amino-acids intravenously, but amigen wa without effect. Intravenous plasma, however, was mor successful. He pointed out that it makes little essentia difference to the patient whether amino-acids reac his systemic blood-stream by way of a syringe or by wa of his portal vein. Workers who have given amino-acid to injured patients with good results, he said, wei dealing with those who were in a bad way to start with—cancer patients after operation, for example. In suc there is little change in the protein balance after injury The fracture and burn cases were all in good healt before their injuries.

Prof. R. B. HAWES suggested that these variou studies would help people to realise what protein shortag means, and would arouse their interest in the probler of surplus foods and their proper distribution.

Reviews of Books

The Science of Nutrition

HENRY C. SHERMAN, professor of chemistry, Columbi University, New York. (Oxford University Press Pp. 253. 15*s*.)

Professor Sherman's name is so well known in th nutritional world that any work by him gives pleasurable anticipation, and such anticipation is not disappointed in this book. It is addressed to the genera public, though it presupposes somewhat more of scientifi curiosity, and of intelligent appreciation, than mos books on nutrition for laymen. Naturally enough th author is mainly concerned with, and draws his illustrations from, the nutrition of the USA. This gives th British something to think about, because he seriousl considers that a third or more of the best-fed nation o the world consumes a "poor" diet. What must th proportion be here? He adds some intimate touches we learn, for instance, that the world's champion heavyweight, Joe Louis, stood in danger of rejection from the service of the armed forces of the USA on th grounds of his weight compared with his height, but wa accepted on measurement of his specific gravity. Hi excess weight was due to brawn and not to fat.

The book is not merely a statement of the present position of nutritional science, but looks to the future both in America and abroad. Its trend is best illustrated by its last sentence: "The question, what particular thing does such nutritional improvement do? hardly admits of a simpler or more specific answer than that it offers us the option of a more liberal term of years of more efficient life with which to do what we will." In short, that we may have life more abundantly.

Pharmacology

(2nd ed.) J. H. GADDUM, SC D, MRCS. (Oxford University Press. Pp. 460. 21*s*.)

THIS long-deferred second edition satisfies an educational need. The basic facts of pharmacology are here described in a manner well suited to the undergraduate, in a happy lucid style. Information is related in just perspective to laboratory experiment and to the practice of medicine.

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P.33

THE LANCET

LONDON: SATURDAY, JUNE 9, 1945

Release and Replacement

THE majority of doctors have expected that the end of the war in Europe would relieve them of strain They have believed that, on the defeat of Germany, their personal burdens would be lightened or shared or at least exchanged for another kind. Some no doubt have expected too much and too soon: after all, it took three years to raise the military medical services to their present strength, and only a month has passed since Germany laid down her arms. Nevertheless it is natural that everyone should wish to know when he may hope to return to something like a normal life, and reassurance about this is requested on every side—in the Forces and outside them. All are painfully conscious of the stresses under which they themselves labour, and are anxious that in any rearrangement these stresses should be recognised and if possible reduced. In the Services the dominant feeling, expressed over and over again, is that the time has come when doctors who have not yet been in uniform and have continued their professional careers should be recruited to permit the release of men who have served long years out of contact with their homes and ordinary work. One of our correspondents this week speaks no doubt for many of his Service colleagues when he says that they ask no privileges beyond those of the rest of the Forces, but want to be released at the same time as combatants in the same demobilisation group. They look to the civilians to replace them where necessary—a plan which seems comparatively simple to those who imagine that the EMS still has a large surplus of young and healthy ministrants. On the other hand civilian doctors, many of whom, as the Central Medical War Committee points out, have been literally working themselves to death, are chiefly aware that they have come near breaking point, and ask that reinforcements should reach them before the seventh winter of war. They for their part are inclined to suppose that the Services have a large surplus of men who will relapse into idleness now that the fighting in Europe is over. From different angles Service-man and civilian unite in hoping that there will soon be large releases from the Forces into civil hospitals and general practice.

But the military authorities also have a point of view. The European war may be finished, but it leaves the armies of occupation confronted with chaotic conditions on the Continent and a great war approaching its climax at the opposite side of the world. People who say that the Army has too many doctors in proportion to the number of the troops may (or may not) appreciate the need to be prepared for battle, but they seldom consider the other demands the medical services must be ready to meet. The RAMC does not merely look after British troops: it undertakes whatever medical tasks may be related to the health and well-being of our own Forces and sometimes those of our allies. Hence for example the fact that of 211,813 soldiers treated in British hospitals in the Middle East last year, only 87,157 were British. Hence the fact that in an Army general hospital in Italy a month ago only half the patients were British, the remainder including Russians, Poles, Africans, Albanians, a Spaniard, Greeks, Indians, Canadians, French Arabs, Italians, and some of the 2000 Yugoslav partisans still in our medical charge. No service without a reserve for emergencies could have suddenly assumed the medical care of the 70,000 inmates found at Belsen concentration camp, where 20,000 patients are still under treatment. An army in which every medical officer was already working continuously to the limit of his powers could scarcely have accepted responsibility for the 2 million displaced persons (of whom the largest contingent are Russians) in the British zone. As it is, whatever has been necessary has been done.

All recognise the remarkable success of the medical services in the war with Germany. But we may say to the Army: "That war is over; Belsen is under control; the displaced persons will be going home; major emergencies should no longer arise. Surely you will be able to make big economies and release a great many doctors from the BLA?" To this the answer is that big economies will be made. In the Army of occupation, instead of units having their own medical officers, the medical services will generally be provided on an area basis, and doctors will work mainly from hospitals or reception stations. The provision of hospital beds will be drastically reduced, and so will administrative medical staffs, and full use will continue to be made of non-medical officers. Big economies will indeed be effected in this way; but unfortunately the doctors thus liberated will mostly be wanted for the war in the Far East, where our present medical strength is well below what is needed for the active operations in prospect. With EMS transit and base hospitals at hand on this side of the Channel it was possible to invade France with a cover of under 5 hospital beds per 100 men; but in the Far East, with its very long lines of communication, its abominable climates, and its special risks from endemic and epidemic disease, it will be necessary to furnish 10 beds for every 100 troops—and the doctors, orderlies, and nurses to staff them. For the first time in modern history the medical services have gone through a war without a single major breakdown in their complex machinery. In former wars breakdowns and scandals commonly arose because there were too few doctors where they were needed, and it is right that the men responsible for the medical services' recent achievements should be determined to prevent any such disaster in the East.

All will agree that the Forces must have the doctors they require. All will agree too that medical officers should, if practicable, be released at the same time as other soldiers of the same demobilisation group. The difficulty is that medical officers (owing to their higher average age) are disproportionately represented in the higher groups; and, failing some special action, operation of the Government's scheme for reallocating man-power will rapidly deplete the medical services while only slowly diminishing the size of the Forces they look after. Many of the officers of long service will therefore have to be retained on ground of military necessity—unless they can be replaced by civilians. The ordinary process of recruiting young doctors within a year or two of qualification will not provide enough replacements; nor can it conceivably replace the specialists, so many of whom are due for early demobilisation because they belong to the highest age-and-service groups. (The 1431 doctors in groups 1 to 11 include 467 specialists.) The Central Medical War Committee intends therefore to call up many older doctors who have not yet served with the Forces. The upper age-limit proposed for this fresh levy on the profession is 35 or 40, which should embrace a considerable number of men and women qualified to become specialists or graded specialists. In a letter this week a Service correspondent suggests an even higher limit (50); and he thinks that, as much of the work required will be non-operational, the Forces should now employ doctors hitherto rejected as unfit. But, whatever impression to the contrary may be given by exceptional cases, it is a delusion to suppose that, even with half the war over, there will be many jobs in the Services offering the assurance of an easy life; and the calling-up of doctors of 40–50, who have generally lost the cheerful adaptability of youth, should if possible be avoided at a time when conscription is unlikely to be applied to other men over the age of 25. The profession has never been backward in supplying the needs of the Forces: since the war began it has provided from Great Britain and Northern Ireland 2405 doctors for the Royal Navy, 12,200 for the Army, and 2564 for the Royal Air Force, making a total of 17,169; which is 27·5% of the number on the Medical Register and 31·3% of the estimated number of active practitioners. While it is desirable that reasonably young and fit civilians should now change places with their colleagues who have suffered long separation from their families, it is at least equally desirable that "reallocation" should mean substantial relief for those at home—i.e., that more doctors shall be released than are recruited. In a letter to the *Times* of May 31 the secretary of the Central Medical War Committee makes it clear that this will in fact happen.

Obviously a balance has to be struck between the various claims. The requirements of the Services remain, as we have indicated, very large, because their commitments are very large. But they are not quite so large as when we were actually fighting the Germans, and the end of the war in Europe gives a chance of rearranging the burdens borne by individuals. The net effect of the schemes now approved will be a lightening of the load of the profession at home, and we may also look forward to the early release of most of the older men who have served for a long time. On another page a Peripatetic Correspondent in the BLA says that the impression left on him by Lord MORAN and others who have lately been addressing medical officers in Belgium and Holland was that it would evidently be a very long time before he came home. But the demobilisation programme then outlined was provisional not final. A few days after his return to London Lord MORAN explained the situation anew in the *Times* of May 30 in a statement whose most significant sentence was: "there is reason to hope that the vast majority of doctors, both general practitioners and specialists, in groups 1 to 11 will be demobilised before the mn."

Therapeutic Value of Blood Proteins

BLOOD-TRANSFUSION has a very wide application in therapeutics because of the multiple factors which blood contains, all or any of which may be valuable in particular circumstances. Until recently there has been no option but to use blood on the shot-gun principle, firing both barrels together with a transfusion of whole blood, or left and right separately with plasma or red-cell concentrates. A patient who needed only one constituent of plasma—for example, the immune bodies—had perforce to receive whole plasma. And to obtain reliable high-titre hæmagglutinating serum, it has been necessary to search for those relatively few individuals who fulfil all the criteria. One may assume that every part of the blood performs an important natural function. Clearly, therefore, it i an advantage to make available as many as possible o its diverse cellular, protein, and lipoid components, i separate and concentrated form, for selective use i appropriate conditions. This concept suggests th brave new world of transfusion which has bee brilliantly initiated and exploited by the Harvar Medical School under the leadership of EDWIN J COHN,[1] who, with the support of the National Researc Council, has had the integrated help of workers skilled in every aspect of the subject.

The methods of separating the various plasm proteins are complex. They depend on differences i the physicochemical properties of the protein according to their individual solubility and stabilit in solutions of different hydrogen-ion concentratio temperature, and dielectric constant, as well as on th concentration of dipolar ions, electrolytes, and mole cules rich in hydroxyl ions. The fractions which hav so far been isolated in the form of dry stable powde are of the following four main types, though other in the globulin class, are available for exploitation i due course.

(1) Albumin, which represents almost 60% of th plasma proteins, but is responsible for about 80% of th osmotic activity of the blood, and is therefore invaluabl as the main constituent of a volume-restoring fluid or fo the treatment of hypoproteinæmia.[3]

(2) Immune bodies in the globulin class, which ha already proved their value in the prophylaxis of measle and infective hepatitis.[4]

(3) Fibrinogen, on which the physical properties of th blood-clot largely depend. This, as such, can be mad into plastics, or, by the addition of thrombin, can b converted into fibrin films, clots, or plastics for use a membranes, or, into fibrin foam for use as a hæmostatic i neurosurgery.

(4) The iso-agglutinins used in blood-grouping work

The prospect revealed by no more than these fou main fractions is bright. Further fractionatio should open up a most promising field for specifi therapy. Whole plasma can now be stored in th fluid state or can be dehydrated from the frozen state but, without freezing, the more labile component (prothrombin, fibrinogen, complement, immun bodies) deteriorate with time. Simple freezin requires an inconveniently large space, but plasm dehydrated from the frozen state has been the main stay of transfusion services for our Forces, particularl

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1. Cohn, E. J. *Chem. Rev.* 1941, 28, 395.
2. *J. clin. Invest.* 1944, 23, 417.
3. Janeway, C. A. *J. Amer. med. Ass.* 1944, 126, 674.
4. See *Lancet* editorial of March 31, 1943, p. 405.

those fighting in tropical climates. Nevertheless, the
treatment of the injured
-volume and maintaining
a stable osmotic equilibrium. This power is largely due to albumin, the smaller molecules of proteins which plasma contains. Albumin is so stable that it
olution which will withstand
ays[3] and at a strength of 25%
blood; furthermore it can be *dehydrated and reconstituted from the dried powder* in any strength required. If the active-service experience of the American Forces proves that albumin solution is the equal of natural plasma for blood-volume *restoration in the injured man, then the hos*pital casualty department of the future need do no more than keep a few bottles on the shelf. Until lately the conferring of passive immunity to the exanthemata has demanded the infusion of the whole plasma or serum obtained from convalescents at an optimum time; moreover, this carries the risk of transference of "homologous serum jaundice."[5] COHN's fractionation of the gamma globulins has shown that the immune bodies are contained in a pseudoglobulin fraction comprising about 5% of the total protein of blood. Thus there is available a material safe for intravenous use,[6] and more powerful than crude convalescent serum taken at the optimum period, and certainly many times more effective than the unselected pool from which the fraction was originally obtained. It is in the pseudoglobulin fractions that interest, from the public health and preventive medicine aspects, will be centred. Their success in measles and infective hepatitis raises hopes that the control of many other exanthemata to which we are commonly exposed is in sight.

The prevention of oozing and bleeding from a site so vascular as to defy control by ligature is always a major problem. The application of muscle tissue[7] is partly effective and has long been practised; oxidised cellulose saturated with thrombin[8] has been well reported on, while topical applications of crude plasma and thrombin have their supporters. COHN's work has made prothrombin readily available (fraction III2), and this may be converted into thrombin and dispensed as a sterile dry powder ready for reconstitution and immediate emergency use. Thrombin alone is useful for stopping the flow of blood during surgical procedures, but to be really effective, it must be applied with a matrix which can hold it in the bleeding area until clotting is complete. An ideal porous matrix is the fibrin foam which can be prepared[9] from human fibrinogen and thrombin in various forms with different mechanical and *biological properties.* At one end of the scale, the material is a light highly compressible product which can be wetted with great ease, and is best suited for hæmostasis in small areas such as the dura mater; at the other end is a dense firm product suitable for packing large cavities such as tumour beds. In all, this material can be used for controlling bleeding from oozing surfaces and even large veins. *Though not recommended for brisk* arterial hæmorrhage, fibrin foam has proved very effective in neurosurgery in controlling bleeding from the dura, tumour beds, dural sinuses, and large cerebral veins. In general surgery, it has been used with success on the cut surface of the liver and kidney; in jaundiced patients, in thoracic operations, and in stopping bleeding in hæmophilia. Furthermore, the porosity of the material allows it readily to absorb water, saline, or thrombin solution and it can be used in conjunction with the sulphonamides or penicillin. *Being a natural human product,* fibrin foam is rapidly absorbed with the minimum of tissue reaction and so can be left *in situ* to prevent recurrent bleeding. In practice[10] three bottles are supplied, containing *dried thrombin, 30 c.cm. of sterile isotonic saline, and* fibrin foam. The foam is cut into pieces of appropriate size in the dry state, and then soaked in a solution of the thrombin before application.

Cohn's fraction I consists largely of fibrinogen. This, in itself, has many uses, and it can also be manipulated to yield a number of valuable products. Skin-grafts can be firmly fixed by dipping the graft in thrombin solution and painting the receiving site with a solution of fibrinogen[10] or by spraying the recipient's site with thrombin solution and dipping the graft in fibrinogen solution.[11] A soft fibrin clot freshly prepared from fibrinogen and thrombin has been used in the removal of renal calculi.[12] From fibrinogen can be made a variety of films,[13] clots, and plastics which can simulate different natural anatomical structures and may be used for implantation into the body to replace such tissue as the dura with the minimum of tissue reaction.

The perfection and extension of this outstanding work should greatly influence the development of post-war transfusion services. The public, if properly approached, should be ready to contribute to a pool *from which, with complete economy, can be extracted* appropriate materials not only for individual diseases and emergencies, but also for the control of epidemics and common infectious diseases. There still remains *the major problem of prolonging the useful life of the* red cell, so that stable red-cell concentrates can at least approach the endurance of frozen fluid plasma. So far no medium has been found for red-cell preservation which is superior to natural plasma. This problem demands the serious consideration of the post-war world.

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5. Bradley, W. H., Loutit, J. F., Maunsell, K. *Brit. med. J.* 1944, ii, 268.
6. Cohn, E. J. *Science*, 1945, 101, 51.
7. Cushing, H. *Ann. Surg.* 1911, 54, 1.
8. Uihlein, A., Clagett, O. T. *Proc. Mayo Clin.* 1945, 20, 29.
9. Bering, E. A. *J. clin. Invest.* 1944, 23, 587.
10. Ingraham, F. D., Bailey, O. T. *J. Amer. med. Ass.* 1944, 126, 680.
11. Cronkite, E. P., Lozner, E. L., Deaver, J. M. *Ibid*, 1944, 124, 976.
12. Dees, J. E. *J. clin. Invest.* 1944, 23, 576.
13. Ferry, J. D., Morrison, P. R. *Ibid*, 1944, 23, 566.

THE United States War Department announced on May 20 that more than a million sick and wounded members of the US and Allied forces had been evacuated from all theatres by the US Army Air Transport Command in the 32 months since the service was started in the South Pacific in 1942. Battle casualties comprised about 35% of air evacuees in 1944, rising to about 50% in the early months of 1945. About 30% were casualties of other United Nations.

Almost all the American casualties evacuated from east of the Rhine in the final phases of the European war were transported by aircraft. More than 300,000 patients were evacuated from the forward to the rear areas in the European theatre between D-day and VE-day, with an estimated peak load for April of more than 60,000. The April load is accounted for partly by the return of liberated prisoners-of-war.

Annotations

ENURESIS AND THE SMALL BLADDER

ENURESIS, always one of the perplexing afflictions of childhood, has emerged in the war years as a pressing social and medical problem in the areas receiving evacuee children, and as an important cause of disability in the serving soldier or of rejection in potential recruits—as a peripatetic correspondent lately recalled.[1] Enuresis in the adult is not incompatible with earning a civilian living, though it rules out many means of livelihood ; but it is incompatible with life in the Services, and in a military environment frequency of micturition is almost equally intolerable.

Careful clinical examinations were made by Backus and Mansell[2] in 277 cases of nocturnal enuresis admitted to a military psychiatric hospital in eight months of 1943. Patients with evident genito-urinary lesions would no doubt have been sent to other hospitals, which probably explains why physical disease of the urinary tract was found in only 7 (of whom 4 had urethral strictures, presumably congenital). But on testing the bladder capacity with a cystometer nearly a quarter of the total were found to have irritable bladders holding less than 300 c.cm. on distension at low pressure (20 c.cm. of water). Backus and Mansell, though they mention that the small bladder is often associated with daytime frequency of micturition, attach no particular significance to it as a cause, per se, of enuresis. Sheppard,[3] however, has drawn attention to it as an explanation of frequency and urgency of micturition in young males, sometimes associated with nocturnal enuresis. The characteristic features he noted were a forceful stream of sterile urine coming from a small hypertrophied bladder holding as little as 6–10 oz. and so irritable that sometimes fluid was ejected past the cystoscope. He raised the question whether these patients are born with a small muscular bladder or develop it as a result of obstruction of the internal meatus, which might be relieved in the early stages by perurethral resection of the faulty sphincter.

Though there is little doubt that enuresis occurs in males with a normal urinary tract, and though both enuresis and frequency of micturition can be due to many of the well-recognised urinary diseases, it seems that a new group of cases has emerged in which frequency, with or without enuresis, is the presenting symptom, and in which investigation reveals no abnormality other than a small hypertrophied bladder, intolerant of distension. The small irritable bladder has long been known to account for frequency of micturition in the female, being occasionally secondary to cervicitis, vaginitis, or cystocele. (Much rarer is the " interstitial cystitis " described by Skene in 1887, in which chronic inflammation of insidious onset spreads from the mucosa through the bladder wall, causing intractable pain and reducing the capacity of the bladder.) If in some cases enuresis and frequency are purely disorders of function, in others they are the result of acquired lesions, and in others again of congenital abnormality. In children enuresis has been entrusted to the pædiatrician ; in adults it is apt to take the patient to the psychiatrist. But it is a symptom rather than a disease, and may indicate disease or disorders almost anywhere in the mind or body of the patient. The fact that a small intolerant bladder is now being found in many cases underlines the necessity for full physical examination before serious treatment of any kind is undertaken. " Those," said Bacon, " who aspire not to guess and divine, but discover and know ; who propose not to devise and mimic fabulous worlds of their own, but to examine and dissect the nature of this very world itself must go to facts themselves for everything."

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[1] *Lancet*, Feb. 24, 1945, p. 254.
[2] Backus, P. L., Mansell, G. S. *Brit. med. J.* 1944, ii, 462.
[3] Sheppard, M. D. *Ibid*, 1944, ii, 124.

ASTHMA FROM SULPHATHIAZOLE

SYSTEMIC and skin reactions to sulphonamides are now familiar, but the case reported by Zanfagna[1] is one of the few examples of asthma arising from sensitisation to these drugs. A soldier of 37, with no previous or family history of allergic manifestations, received two 5-day courses of sulphathiazole, 1 g. four times daily by mouth, for acute gonorrhœa, with 5 days' interval between them. A month later, the gonorrhœa being still present, he was given the same dosage for 8 days, at the end of which he developed giant urticaria, followed 2 hours later by gross angioneurotic œdema and asthma, lasting for 24 hours. Skin and patch tests with sulphathiazole were negative, but a strong reaction was obtained by the intradermal injection of 0·2% sulphathiazole solution. Later he was given 0·5 g. of sulphathiazole by mouth and again developed asthma. Here there was a definite indication for sulphonamide therapy, but the case emphasises another danger of indiscriminate use of these compounds by mouth, locally, or in sprays or gargles. This was also a case where desensitisation would have been of great benefit ; without it this soldier is left in the predicament of being intolerant to the standard treatment for wounds and the commoner bacterial infections. The method suggested by Erskine[2] and developed by Tate and Klorfajn[3] in patients with sulphonamide dermatitis might be applicable to such cases. When sensitisation symptoms arise they give a desensitising course of the sulphonamide, beginning with a dosage small enough to produce only slight or moderate symptoms (usually 0·125 g. twice daily, but sometimes 0·06 g. or less), doubling the dose when the reaction has subsided, and so continuing until the patient can tolerate 2 g.

MYSTERY OF NOMA

THE disease variously known as cancrum oris, noma, gangrenous stomatitis, or cancer aquaticus (owing to the accompanying ptyalism) is regarded as almost invariably fatal. Fortunately it is very rare, though it still appears occasionally among poor and undernourished communities in both hemispheres. It develops as a complication or sequel of measles, scarlet fever, or other infection in children between 1 and 6 years, and first appears as an indurated red swelling on the cheek. The mucous membrane on the inner side of the cheek is intensely inflamed around an irregular ulcer with a sloughing base. The ulcer spreads rapidly, in the form of a sloughing necrosis, in the cheek and to the lips, gums, and even the jaws. Spirochætes, diphtheroid bacilli, and a multitude of pyogenic cocci are found in the lesions, but no specific organism has been implicated. This sounds like the work of a micro-ærophilic streptococcus of the kind responsible for the postoperative gangrene of the skin which Meleney[4] has described in detail and two cases of which were lately reported by Grimshaw and Stent[5] in these columns. Both conditions usually affect debilitated patients, and both are commonly fatal. Meleney has had good results with zinc peroxide paste in the postoperative cases, but it is difficult to obtain active preparations of zinc peroxide, and Grimshaw and Stent obtained dramatic healing in their second patient with intramuscular penicillin. In a beautifully produced monograph on noma[6] de Carvalho advises free excision with the electro-cautery, buccal lavage with potassium permanganate solutions, and careful attention to the accompanying dietary deficiencies, especially B-complex deficiency ; of his 3 cases 1 recovered with these measures, and his advocacy of permanganate applications conforms with the views expressed by Dr. Frank Marsh in a letter in this issue. Marsh and Wilson[7] have obtained rapid healing in resistant cases of tropical ulcer—another type of cutaneous necrosis—by dusting the raw area with powdered potassium permanganate, and Marsh proposes permanganate as a more readily available substitute for zinc peroxide in postoperative and scrotal gangrene. De Carvalho quotes 6 cases of noma reported from Mexico by J. H. Valenzuela which all recovered with local sulphathiazole, systemic sulphapyridine, blood-transfusions, and oral lavage with sodium hypochlorite.

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[1] Zanfagna, P. E. *Bull. US Army med. Dept.* January, 1945, p. 117.
[2] Erskine, D. *Lancet*, 1942, ii, 568.
[3] Tate, B. C., Klorfajn, I. *Ibid*, 1944, ii, 553.
[4] Meleney, F. L. in Christopher's Textbook of Surgery, 1939.
[5] Grimshaw, C., Stent, L. *Lancet*, April 7, 1945, p. 434.
[6] de Carvalho, C. O Misterio do Noma, Rio de Janeiro, 1944.

NEUROTIC AND PSYCHOTIC CASUALTIES

DURING this war the Services have shown more interest in the man with a psychiatric disability, and his fate on returning to civil life, than ever before. In pointing this out to the Ex-Services Welfare Society at their annual meeting on June 1, Lieut.-General Sir Alexander Hood was not implying that plans for resettlement for such patients are complete; and indeed the discussion revealed wide gaps which the society hopes to see bridged.

The needs of the psychiatric casualty, especially the neurotic, were thoroughly aired, from first aid in the form of sedation to guidance in resuming full civil responsibility. Brigadier J. R. Rees compared the initial treatment by sedation to the splinting of a wound; but added that just as a wound also called for debridement the man with a neurotic lesion needed the opportunity to abreact his symptoms. If this is denied him he may be left with chronic neurosis, very much as a wound may develop an abscess. Dr. Noel Harris, who shared this view, mentioned the value of narco-analysis, and hinted at an experiment in group narco-analysis which he was about to undertake. Much can be done, he said, for the man while he is yet in the Forces: psychotic patients may be kept in the Service and treated for up to 9 months before being sent to a civil hospital under certificate. The numbers are not large: only 3·5% of cases referred to Army psychiatrists are psychotic. Treatment before discharge may not always be adequate however; thus, answering Brigadier Rees's view that to give a neurotic man a pension is to do him a great injury, Lieut.-Colonel P. K. McCowan pointed out that a man who breaks down in the Far East may have to wait a long time for transport, and in the meantime may get little treatment. If he is psychotic this delay may be even more serious than if he is neurotic, since the best time for electrical convulsion therapy may pass unheeded. In such cases, Colonel McCowan felt, the Ministry of Pensions ought to have the onus of proving that no good would have come of the treatment even had it been given. Proper treatment is more important than a pension and this change in responsibility would help to impress on the Ministry the importance of early treatment. Dr. J. F. E. Prideaux agreed to put this point to the Ministry of Pensions, though he foresaw difficulties; however, the Ministry accepts a similar responsibility in the case of cancer patients, and he thought the suggestion would be discussed sympathetically. It is evident that some patients who have been denied psychiatric treatment feel they would have been the better for it, as some figures presented by Dr. Eric Guttmann showed. Only 5% of a large group of men discharged from the Services on account of neurosis had been treated by a psychiatrist, though 70% had had medical treatment. Air Vice-Marshal C. P. Symonds said that some men who are incapable of a sustained mental effort can carry out a job provided they can be given some extra leisure for rest and treatment: and these, too, need the financial security of a pension.

There was a general feeling that the neurotic patient should not be segregated from patients of other types during reablement, or be made to feel that he was different from them in any other way. Mr. Everett Howard, general secretary of the society, who had made a tour of inspection of Government training centres on behalf of the Ministry of Labour, held that the more normal the conditions under which the neurotic can work the better. The aim is to fit him for ordinary life among ordinary people, and to segregate him among other neurotics only encourages him to indulge in what Prof. J. le F. C. Burrow called "organ recitals." The disposal of the psychotic or neurotic man on discharge will of course vary with his state. Both Professor Burrow and Dr. R. D. Gillespie emphasised the good results which can be achieved in the wards of a general hospital, and Dr. E. C. Dax foresaw advances in mental treatment which would get rid of high walls and locked gates and bring mental hospital practice into line with that in general hospitals. Interchange of staff between general and mental hospitals was warmly advocated. For the neurotic, Government training centres, industrial centres, and sheltered industries were all felt to have a place, though Dr. E. D. Moir suggested that training for jobs ought to be left to employers in industry: technical methods change too rapidly for outside training to be useful.

Dr. W. S. Maclay and Dr. Doris Odlum described the after-care scheme sponsored by the National Council for Mental Health, which is already doing good service. Each hospital under the scheme has had a psychiatric social worker allotted to it, who sees the patient and finds out what kind of help is needed. She works under an experienced regional after-care officer who deals with the patient's problems at home and at work, and who keeps in touch with the employer, the local authority, and the labour exchange. Dr. Maclay suggested that self-supporting industries might be developed within mental hospitals—a thoroughly promising idea. Dr. Thomas Beaton described the experience of Portsmouth where a successful comprehensive psychiatric service has been created. Practical in everything, he insisted that attention should be directed to what is normal about the man to be treated, not to a hunt for what is abnormal. Those who want to help him must go and look at his home, consider his difficulties, help him financially if that is what he needs, and discourage him from thinking himself ill. He claimed to have said to more than one: "Don't go near another doctor for the rest of your life."

VINCENT'S INFECTION

MUCH work has been done on the ætiology of acute ulcerative gingivo-stomatitis (Vincent's type), but few definite results have been obtained. The association of spirochætes and fusiform bacilli with the lesions has been recognised since the disease was first investigated microscopically, but of recent years doubt has been cast on their pathogenic rôle. The fact that these organisms can be found in small pockets associated with chronic gingivitis in the majority of patients has suggested that the increase in numbers of spirochætes and fusiform bacilli in the acute cases is due merely to conditions having been made more favourable for their growth. On this hypothesis it has been postulated that acute ulcerative gingivo-stomatitis is due to invasion of the gum tissues by some other organism or virus, and that the spirochetes and fusiform bacilli are merely secondary invaders. The difficulty in obtaining pure cultures of the various organisms found in the disease, especially of the spirochætes, has obstructed experimental work on the subject. Tunnicliff[1] and others claimed to have grown the spirochæte anaerobically, and maintained that it appeared as a stage in the growth of the fusiform bacillus. This view has not been generally accepted, and most recent workers have failed to grow *T. vincenti* at all. The experimental inoculation of spirochætes and fusiform bacilli into animals has never produced the disease, though Smith[2] has shown that inoculation of a mixture of spirochætes, fusiform bacilli, streptococci, and vibrios produced abscesses in animals. It must be remembered, however, when assessing these results, that organisms pathogenic to man are not necessarily pathogenic to the experimental animal.

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[7] Marsh, F., Wilson, H. A. *Trans. R. Soc. trop. med. Hyg.* 1945, 38, 239.

[1] Tunnicliff, R. *J. infect. Dis.* 1906, 3, 148.

General diseases of certain types, and vitamin deficiencies, appear to predispose to the condition. It has been known for some time that diseases characterised by leucopenia or alteration of the leucocytes—agranulocytosis, leukæmia, glandular fever, &c.—often show ulcerative gingivo-stomatitis as one of their most distressing features. It is interesting in this connexion that recent work with 'Scillaren B,' a glucoside mixture producing leucopenia, has shown that injections of the drug into an animal predispose it to attack by spirochætes and fusiform bacilli. The association of ulcerative stomatitis with local damage, or intoxication—e.g., bismuth and mercury stomatitis—is also a common observation. In recent years vitamin deficiencies have been cited as the main predisposing cause of the disease. Vitamins A, B, and C have all had their share of attention, and King[3] has reported that nicotinic acid combined with local measures seemed more beneficial than local measures alone; in his experience vitamin-C supplements did not accelerate healing. The two main predisposing and precipitating factors in the causation of the disease seem to be: (*a*) lack of resistance in the gingival tissues, brought about by various local or general conditions; and (*b*) invasion of the tissues either by some unidentified organism or virus which is causal and also provides a suitable environment for the excessive growth of spirochætes and fusiform bacilli, or by the spirochætes and fusiform bacilli themselves.

Attempts to raise the resistance of the tissues by vitamin therapy have not proved particularly encouraging, except possibly as an adjunct to local treatment; and local treatment, both mechanical and chemical, still remains the accepted practice. This usually takes the form of syringing, packing, scaling, and application of oxidising agents and caustics, sometimes followed in severe cases by gingivectomy to eliminate the gum pockets and areas of stagnation. MacGregor and Long[4] have shown that the infection in its acute stages responds rapidly to penicillin in pastilles allowed to dissolve in the mouth. With pastilles containing 500 units of penicillin taken at regular intervals by 75 patients, clinical improvement was well marked after 24 hours and the spirochætes disappeared in the same period; the fusiform bacilli were absent or greatly diminished after 48 hours, and in 72 hours both organisms had disappeared from the films in all patients. After 5 days of this treatment, clinical and bacteriological improvement was such that the pastilles were stopped. The coincidence of clinical improvement with disappearance of the spirochætes and fusiforms suggests that either these organisms themselves or some other hitherto unrecognised penicillin-sensitive organisms are responsible for the acute inflammation. The treatment devised by MacGregor and Long is a distinct advance in the treatment of the acute form of the disease since it can be carried out easily and rapidly without frequent attention by the dental surgeon. They point out, however, that, even after scaling and general hygienic measures have been carried out, gingivectomy, extraction of wisdom teeth covered by a gum flap, and similar measures may later be needed, because while gum pockets remain recurrence is still possible. Further evidence of [illegible] has lately been published by Greey [illegible] Canada. They have shown that penicillin included in an agar base is effective, and its use in the mouth resulted in all instances in the rapid elimination of the infecting organisms together with prompt alleviation of clinical symptoms and signs. A different technique of application has been adopted by Thexton and Dick[6] in this country. They apply the penicillin to the gum tissues by incorporating it in a pack, and their preliminary results have been excellent—in 15 cases symptoms vanished in 24 hours. They agree, however, that the pastille methods of application is preferable, where pastilles are available. The value of penicillin in the treatment of the condition now appears to be beyond doubt.

MEDICAL STUDENTS AT BELSEN

"No other group of people could have done the job." Dr. A. P. Meiklejohn, adviser on nutrition to the Rockefeller Foundation and UNRRA, thus commends the work of the 96 medical students from the London teaching hospitals who volunteered to serve in Belsen camp. Dr. Janet Vaughan, at the Royal Society of Medicine on May 29 (see p. 723), described conditions in the camps while this welcome aid was lacking, and her picture gives a measure of the need. Some 29,000 released prisoners were transferred to the panzer training school alongside the camp, and here the medical students, working in pairs under the official relief teams, were made responsible for the huts, one pair to each hut of 150 people. They brought, as Dr. Meiklejohn said, initiative, energy, enthusiasm, team spirit, medical knowledge, and hope. No doubt they also brought an ability to make reassuring jokes. They scrubbed the filthy floors. they organised the fitter prisoners into hospital staff, they fed the starving who had been too weak to succeed in the scramble for food, and they attended to the needs of the worst cases. Patients with a chance of recovery and typhus cases were evacuated first, and as the daily drafts went off. and conditions became easier, the students were able to plan a hospital area within the camp itself. They share the credit for the fact that within ten days of their arrival the death-rate had dropped by half. No doubt Dr. Meiklejohn is right in thinking that an equal number of doctors could not have worked together in the same way. Students carry the sense of community gained in schooldays into the wards of their hospitals: they have not yet been chiselled by life into the rugged individualists who distinguish our profession. It was a fine stroke of imagination to send them where their team spirit was of such moment.

Of the students who returned to England last week one (from King's College Hospital) has developed typhus and three (from Bart's, the London, and the Middlesex) are under observation.

A COLOUR film showing the movements of the brain during head injuries, as seen through a lucite calvarium, has been made by the Medical Corps of the United States Navy. This film will be shown by Lieut. Robert Pudenz at the house of the Royal Society of Medicine, 1, Wimpole Street, London, W1, at 4.30 PM on Friday, June 15. Lieut.-General Sir Alexander Hood, director-general of Army Medical Services, will preside.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—Surgeon Captain Macdonald Critchley will now deliver the Croonian lectures, which had to be postponed owing to VE-day, on Tuesday and Thursday, July 10 and 12, at 4.30 PM. He is to speak on problems of naval warfare under climatic extremes.

LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY.—The annual meeting will be held at Victory House, Leicester Square, London, WC2, on Wednesday, June 20, at 3.30 PM.

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[2] Smith, D. T. *Ibid*, 1930, 46, 303.

[3] King, J. D. *Brit. dent. J.* 1943, 74, 174.

[4] MacGregor, A. B., Long, D. A. *Brit. med. J.* 1944, ii, 686; *Brit. dent. J.* 1945, 78, 33.

[5] Greey, P., Macdonald, I. B. *Canad. med. Ass. J.* 1945, 52, 327.

[6] Thexton, R., Dick, P. K. *Brit. dent. J.* 1945, 78, 292.

Special Articles

FAMINE IN BENGAL

REPORT OF THE INQUIRY

The Bengal famine was one of the great catastrophes of the war. Unlike the war-time famines in certain European countries it was not due to the deliberately inhuman policy of a conqueror, but to a number of causes which can be studied with profit. A 200-page report[1] shows that the investigating commission has done its work well. Evidence has been obtained from no less than 285 witnesses, and the spirit of the inquiry is summed up in the sentence: "numerous lessons which should be of value in the future can be drawn from the sequence of events which led to the tragedy of 1943."

The various aspects of the famine were so complex, and its causes so intertwined, that it is essential to keep in mind the bare facts of what happened. In 1943, in an area not itself the seat of active military operations, though it was an important military base, many of the inhabitants went short of food. Famine was accompanied by widespread economic and social dislocation, and by severe epidemics. During this period "1·5 million deaths occurred as a direct result of the famine and of the epidemics which followed in its train."

ORIGINS

The background of this tragedy was stated thus by one of the witnesses:

> "Until Japan declared war, India had no serious food problem beyond the fundamental truth that two-thirds of its population normally existed at a level little above the starvation line, and, by western standards, well below it. That in itself is an important fact, the effect of which is to be fully grasped before the true significance of the situation which ultimately developed can be understood. Its effect was that a slight disturbance of the economic practices of the country, and a small diminution of the overall [illegible] to bring large classes within the range of famine."

Such a tilting of the scale, in fact, took place. In 1942 the winter rice crop was deficient, and there was less than the normal carry-over of stocks from 1942 to 1943. The government of Bengal failed to control the price and distribution of rice, the price rose, and many found that that essential foodstuff was beyond their means. Then, owing to the loss of the normal imports from Burma and to the restrictions imposed on the movements of grain from one province to another, the usual supply from outside Bengal was not available. In great detail the commission deals with the failure to control the price of rice. It is a tragic tale of lack of foresight and drive on the part of the Bengal government, and of greed on the part of the rice merchants. The price of rice rose to fantastic heights during 1943, and this rise was one of the main causes of the famine.

> "What happened was that producers sold their rice as they thought fit at the best price they could obtain, or [illegible] could and not as much as they needed. The results were on the one hand unprecedented profiteering and the enrichment of those on the right side of the fence; on the other, the rise of prices to fantastic heights and the death of perhaps one and a half million people. It has been reckoned that the amount of unusual profits made on the buying and selling of rice during 1943 was 150 crores" (£112 million).

Meanwhile, the country was suffering acutely from shortage of transport. Road transport was scarcer than ever, and boats had been taken off the rivers at the threat of invasion by the Japanese. Relief measures were hampered at the start by the failure of the government, for propaganda reasons, to declare that a state of famine existed. A change of government in Bengal also held matters up.

> "It appears that at one stage in 1943, the expenditure on relief was limited on financial grounds . . . Between the Government . . . and the various political parties, and, in the early part of the year, between the Governor and his ministry, and between the administrative organisation of Government and the public there was lack of coöperation which stood in the way of a united and vigorous effort to prevent and relieve famine. The change in the Ministry in March–April 1943, failed to bring about political unity. An 'all-Party' Government might have created public confidence and led to more effective action, but no such Government came into being. . . . During and preceding the famine, there were changes in key officers concerned with food administration. In 1943, there were three changes in the post of Director of Civil Supplies."

The Government of India is criticised for failing to recognise early enough the need for sending food into Bengal, and "the public in Bengal, or at least certain sections of it, have also their share of blame."

EFFECTS

The second part of the report deals with the public [illegible] itial difficulty was [illegible] on what was going [illegible] lia are inaccurate." Such mechanisms for collecting them as existed in normal times were disrupted during the famine. Thus, if we are to believe the official figures, the neonatal death-rate actually decreased by 26% in 1943. The official figures were used as a basis for the commission's estimates, though it was borne in mind that "the quotation of recorded mortality figures, including digits down to the tens of hundreds, and the calculation of percentages to one place of decimals, tends to give a false air of accuracy." The broad conclusion was however arrived at that "mortality during the first six months of the famine was related to the degree of local scarcity. But in almost all the districts, whatever their position as regards production and supplies of rice, there was some increase in the death-rate. The rise in prices was general throughout Bengal and led to starvation even in districts which were not obviously deficient in their total supplies. Further, epidemic disease was not confined to the areas in which food shortage was most acute."

The causes of death were starvation and the epidemics to which a starving population rapidly succumbed. "At first starvation alone was more prominent, later, epidemic diseases took precedence over starvation, and their suppression became the main problem." Yet "the difference between death from simple starvation and death occurring in a starved individual who is suffering from disease is . . . a negligible difference when the broad facts of famine mortality are under consideration." Famine diarrhœa and famine œdema often accompanied starvation, but the clear-cut vitamin deficiency diseases were rare. The chief and most fatal epidemics were of malaria, smallpox, and cholera.

The commission discusses the relation between epidemics and famine. Social disorganisation and mass migration increased the opportunities for contagion with smallpox. Cholera was aided by a general carelessness in the quality of food taken, and probably also by a diminution, in an undernourished population, of the protective acid gastric secretion. The high fatality of malaria was probably due to diminished resistance of the population, and not to the appearance of a new and more virulent strain of malaria parasite, for which there was no evidence.

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[1] Famine Inquiry Commission. Sir John Woodhead (chairman); Mr. S. V. Ramamurty; Sir Manilal Nanavati; Mr. M. Afzal Husain; Dr. W. R. Aykroyd; Mr. R. A. Gopalaswami (secretary). A limited number of copies will be available shortly at India House, Aldwych, London, WC2.

RELIEF

The chapter on medical relief may be summed up by the phrase "too little and too late." Doctors have always been scarce in India, and many who would otherwise have been available for relief work were in the army. Nurses were even more scarce, and sweepers, who are "of vital importance in Indian hospitals," were scarce too. Medical supplies were very short. Yet there were some redeeming features. One was the vigour and ultimate success of the vaccination and inoculation campaign. Out of a population of 60 million, 24 million were vaccinated and over 15 million inoculated against cholera in the space of ten months. The second was the immediate improvement that followed the visit of Lord Wavell to Calcutta in November, 1943, after which the army was put on the job of relief. The army had drive, efficiency, and transport; it was incorruptible and not bothered by political or communal considerations. It took its coat off and got down to the job, and the result was an all-round change for the better.

The commission deals in detail with the difficulties in providing buildings, staff, and equipment for emergency hospitals, and sums up this section thus:

> "The health situation which arose in 1943 was beyond the control of any health or medical service. The health and medical services in Bengal, were, however, unfitted to meet the emergency because of defects in organisation and inadequacy and insufficiency of staff, and some of the mortality which occurred could have been prevented by more vigorous and timely measures. During the famine period up to November, 1943, there was almost a complete breakdown in the health services. In November the atmosphere of defeatism was partially dispelled and much effective work was subsequently done in the medical and public health spheres. Even at this late period, however, there were many unnecessary delays and failures. The story is, in fact, throughout one of belated efforts to bring the situation under control. This is said with full understanding of the numerous and formidable difficulties and full appreciation of all that was eventually done to overcome them."

PREVENTION

The last section of the report deals with the system of supply and distribution, and calls for vigorous action against the corruption found at all levels. Then follows a chapter on rehabilitation which is worthy of a review to itself. Briefly, the commission recommends that a rehabilitation commissioner be appointed to supervise the restoration of lands to those who have lost them, the care of orphans, the building of houses, and (of great importance) the rehabilitation of the skilled artisans such as fishermen, carpenters, potters, and weavers, on whom the economy of Bengal is built. Finally, the food habits of the population are discussed, and recommendations made that wheat be used when possible in place of rice and that the population should make more use of the readily available fish supply.

In a separate minute which one of the members of the commission appends to the report, the issue of the famine is fairly stated. The famine was foreseen, it could have been prevented, and, once it had started, it could have been mitigated. The closing paragraph is as follows:

"October 1943, in the fifth year of the war, witnessed a sudden change in the attitude of the Government of India. At the Fourth Food Conference held in October, 1943, the President (Sir J. P. Srivastava) said:

> '. . . we must think of each other and not of ourselves. . . . In the mobilisation of India's resources the Government of India will have to take and implement decisions which may at times conflict with what appear to be local or sectional interests. Whenever possible, and to the greatest extent possible, the Government of India will proceed after consultation with you and with your consent, but if circumstances should compel us to proceed otherwise, I look to you to accept and implement those decisions which we, and we alone can take on behalf of all. . . . We can no longer afford either failure or prospect of failure, and I, in the discharge of the duty which is mine, shall not hesitate to exercise whatever degree of superintendence and control at every stage may be necessary, or to invoke the use of whatever powers are essential to ensure success.'

"This is what had been urged from the beginning of 1940. An early decision on these lines would have saved Bengal. This decision, one is constrained to say, was arrived at when the famine had almost spent itself."

GENERAL MEDICAL COUNCIL

SUMMER SESSION, MAY 29–JUNE 2

AT the conclusion of the President's address, reported in these columns last week, a vote [illegible] by Sir Kaye le Fleming and second[illegible] Prof. J. M. O'Connor was introd[illegible] of the National University of Ireland; Dr. Andrew Davidson as Crown nominee for Scotland; and Dr. N. E. Waterfield as a representative of the general body of practitioners of England and Wales.

The names of *John Holden Beckett* and *Ivor Llewellyn Edmunds* were restored to the Dentists Register after penal erasure.

Penal Cases

The council ordered the Registrar to erase from the Medical Register the names of the following practitioners who are serving prison sentences:

Delbert Evans, registered as of Flat 116, 55, Park Lane, London, W1, MB TORONTO (1903).

Francis Vincent Hanratty, registered as of Little Sutton, Birkenhead, LRCPI (1911).

Zaky Risk, registered as of 15, Sheaf Lane, Sheldon, Birmingham, 26, LMSSA LOND. (1930).

Mohammed Farid, registered as of 44, Olton Boulevard East, Acock's Green, Birmingham, MRCS (1929).

The first three were convicted of criminal abortion, the fourth of unlawfully killing a woman.

BREACH OF PROFESSIONAL RELATIONSHIP

Richard Thorz, registered as of Canterbury Hall, Cartwright Gardens, London, WC1, MD PRAGUE (1929), appeared before the council on the following charge:

> That being a registered medical practitioner and standing in professional relationship to Mrs. A. B., her husband Mr. A. B., and their children, you (1) between July 6, 1944 and about the middle of October, 1944, behaved improperly to Mrs. A. B.; (2) on a day unknown between about the end of August, 1944, and about the middle of October, 1944 committed adultery with Mrs. A. B.; (3) between about the end of August, 1944, and about the middle of October, 1944, frequently committed adultery with Mrs. A. B. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect.

Dr. Thorz was accompanied by Mr. A. A. Pereira, of counsel, instructed by Messrs. Le Brasseur & Oakley for the London & Counties Medical Protection Society. Mr. H. Heathcote-Williams, of counsel, instructed by Messrs. Waterhouse & Co., the council's solicitor, prosecuted. The complainant was "Mr. A. B."

Mrs. A. B. testified that she was caretaker of the house where Dr. Thorz had practised in North London. Her husband worked elsewhere. Wishing to sleep there one night, the doctor had asked her to show him how to set up a folding bed, and had then attempted to have sexual connexion with her. She had resisted him. Later however, after much pestering, she had given way and committed adultery with him. Adultery had taken place two or three times after that. Her husband was on his panel and he had treated her at various times. "Mr. A. B." gave evidence of his wife's confession and of an interview he had had with the doctor, in which the latter had submitted to being struck in the face and had begged for mercy like "a white-livered dog." Dr. Thorz denied the whole of the wife's and the complainant's story, putting it down to vivid imagination and hysteria induced by air-raids. The council found the facts proved and ordered his name to be erased.

Alfred Herbert Bartley, registered as of Aspley Lodge, Woodbourne Avenue, Streatham, London. SW16, MR

(1934), appeared before the council on the following charge:

> That being a registered medical practitioner, and standing in professional relationship to Mrs. A. B., her husband Mr. A. B., and her cousin Mrs. C. D., you (1) between February, 1944, and March, 1945, behaved improperly to the said Mrs. A. B.; (2) on a day unknown between February, 1944, and March, 1945, committed adultery with Mrs. A. B.; (3) between February, 1944, and March, 1945, frequently committed adultery with Mrs. A. B.; (4) having in or about December, 1944, and again on Jan. 30, 1945, undertaken to Mr. A. B. to cease seeing or having any contact whatever with Mrs. A. B., continued secretly and in breach of such undertakings to meet and improperly associate with Mrs. A. B. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect.

Dr. Bartley was accompanied by Mr. Geoffrey Howard, of counsel, instructed by Messrs. W. R. Bennett & Co.

Mr. Heathcote-Williams, opening the case for the complainant, "Mr. A. B.," said that Mrs A. B. introduced a female cousin of hers to the doctor for treatment in February, 1944. She had been expecting to meet his locum tenens, and had not known him before. After that day he had made opportunities for meeting her and had given her the impression that he was more than professionally interested in her. Adultery was first committed in his surgery a fortnight afterwards, and had been repeated at frequent intervals there and in Mrs. A. B.'s flat and at other places. He had treated her for a cough and given her several bottles of medicine, and had prescribed medicine and tonic for a rash. At the request of her husband he had examined her foot, which had a deformity, and had given her a certificate for special footwear. The husband's suspicions were aroused in August, and after a time the wife confessed adultery. Twice the doctor gave the husband a written undertaking to break off the association, but he soon broke both these promises, and after he had broken the second, the husband complained to the council.

The husband and the wife both testified to the facts counsel had stated, and Dr. Bartley gave evidence in his own defence. He said he was an Anglo-Indian, born in Aden, and had practised in India until 1937 except for a visit to this country to qualify for registration. No mention had been made of the husband paying a fee for the cousin's treatment, and he had never sent in an account for it. Mrs. A. B. had not been a patient of his until about September, the adultery (which he admitted) having begun in February. He had regarded her and her husband as his friends and had therefore made no charge for treating them. He had treated the husband after an accident, but had been told to send in the account to the London Passenger Transport Board, against whom the husband had a right of action. He blamed the husband for throwing him and the wife together after he had given an undertaking never to see her again.

Mr. Howard pleaded in his address that if a doctor gave his mistress medical treatment he infringed no rule of ethics, but the council found the facts proved to their satisfaction and directed the registrar to erase Dr. Bartley's name from the register.

Arthur Henry Hennessy, registered as of Devon, Limpsfield Road, Sanderstead, Surrey, LMSSA LOND. (1928), appeared on the following charge:

> That being a registered medical practitioner, and standing in professional relationship to Miss A. B., you (1) on Sept. 26, 1944, attempted to commit adultery with Miss A. B.; (2) on Sept. 26, 1944, indecently assaulted Miss A. B.; (3) on Sept. 26, 1944, assaulted, or were party to an assault upon, Miss A. B. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect. The complainant was Miss A. B.

Mr. Heathcote-Williams prosecuted, and Mr. Oswald Hempson defended on behalf of the Medical Defence Union. After a long hearing in camera, the council found the charges proved and ordered the erasure of Dr. Hennessy's name.

John Neil Leitch, registered as of 1, Crescent Wood Road, Sydenham Hill, London, SE26, MRCS ENG. (1919), appeared before the council on the following charge.

> That you were at the Central Criminal Court at its session commencing on Jan. 9, 1945, convicted of the following misdemeanours, viz.: (1) with intent to defraud you attempted to obtain the sum of £99 12*s.* 8*d.* from the War Damage Commission by false pretences; (2) with intent to defraud you obtained the sum of £50 from the War Damage Commission by false pretences; and (3) being an undischarged bankrupt you obtained credit to the extent of £33 2*s.* 4*d.* from John Northcott and £63 16*s.* 11*d.* from Samuel Hugh Holloway without informing them that you were an undischarged bankrupt, and were ordered to be imprisoned for twelve months.

Mr. S. Winterbotham, the council's solicitor, said that in the autumn of 1942 Dr. Leitch had become tenant of a house in Sydenham. In May, 1943, he had claimed compensation for war damage to an amount of £99 12*s.* 8*d.* The commission paid £50 on account while the claim was being investigated. Much of the work had never been necessitated by war damage, and some had been done before Dr. Leitch took the house. The credits had been obtained in connexion with the work.

Dr. Leitch, who was not represented, said he had known nothing of the forms that had to be returned to the commission, nor of the work done; he had left the whole matter to agents, rightly or wrongly. Of the two creditors, one had been paid in full and the other more than half before the trial. About half his total debt had been paid back, and [illegible] himself. He had a wi[illegible]. He produced a testimo[illegible] and one from the governor of Maidstone Prison. The council, however, decided that his name must be erased.

REMOVAL OF AN ENTRY OBTAINED BY FRAUD

The council, acting under sect. 26 of the Medical Act, 1858, gave the registrar formal notice in writing to erase from the register the entry made therein on Oct. 4, 1943, in respect of Mrs. *Doreen Warren*, MD BERLIN, 1937, under Defence Regulation 32B and the Medical Register (Temporary Registration) Order (No. 2), 1941. This lady was sentenced at the Manchester Assizes on May 11 to six months' imprisonment for procuring registration by a false declaration.[1]

DRINK CHARGES

Annie McCrorie, registered as of 181, Queen's Drive, Crosshill, Glasgow, MB GLASG. (1907), appeared because of convictions in July, 1941, and December, 1941, of driving and being in charge of a motor-car while incapable of having proper control through drink. She was represented by Mr. Aiken Watson, of the Scottish Bar, instructed by Messrs. Gordon, Smith & Parker, solicitors of Glasgow. The council, confident that she would take the warning to heart, did not erase her name nor suspend judgment.

James Kirkness, registered as of 5, Warrender Park Crescent, Edinburgh, 9, LRCP EDIN. (1925), appeared before the council after a year's probation. He had been found guilty last summer of twice in 1942 having been incapable through drink of properly carrying out his professional duties towards his patients who were waiting to consult him. The council were satisfied by the evidence which he produced of his good conduct in the interval.

ANONYMITY OF PARTIES

At the close of one of the day's proceedings two press photographers photographed the "Mr. and Mrs. A. B." of one of the cases. Next day the President remarked that the council had no power to prevent such action, but he appealed to the press representatives present to prevent the publication of the photographs if possible. If they were reproduced in any newspaper on sale in the neighbourhood where these persons lived, the precaution taken by the council to conceal their identity would be absolutely useless. Publication would, in the opinion of the council, be a grave breach of the decency and decorum of the press. His warning was heeded and the photographs were suppressed.

Pharmacopœia Committee

According to the report of the Pharmacopœia Committee, the sales of the *British Pharmacopœia*, 1932, amounted to £56,282 by Nov. 20. 1944. The Seventh Addendum became official on Feb. 1. 1945. Now that the war in Europe is over a new pharmacopœia will be produced as soon as possible.

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[1] *Lancet*, June 2, p. 708

When the council ended its summer session at midday last Saturday, many cases had to be adjourned to another session. The council's penal work has increased so much that another extra session may be necessary between now and November—four sessions in all this year.

MEDICAL PERSONNEL OF UNRRA

THE medical staff of the health division of UNRRA (European region) is as follows:

Director of health: Dr. Andrew Topping (late LCC).

Deputy directors: Dr. N. M. Goodman (Ministry of Health) and Lieut.-Colonel H. R. Leavell (USPHS).

HEADS OF SECTIONS AND ASSISTANTS

Medical services and supplies: Dr. J. G. Johnstone (LCC).

Epidemic control and medical intelligence: Dr. George Stuart (late Colonial Medical Service).

Medical services to displaced persons: Dr. R. L. Coigny (late French Air Force Medical Service).

Nutrition: Colonel V. P. Sydenstricker (USPHS), Lieut. Colonel R. E. Butler (USPHS), and Dr. A. P. Meiklejohn (Rockefeller Foundation).

Nursing: Miss F. N. Udell (College of Nursing).

Medical specialists—
- Tuberculosis: Lieut.-Colonel R. S. Gass (USPHS) and Dr. Marc Daniels (Prophit research scholar).
- Maternity and child welfare: Prof. R. R. Struthers (Montreal) and Dr. Audrey Russell Ellis (medical director, International Commission for War Refugees).
- Appointment of other specialists (e.g., for venereal diseases) is under consideration.

COUNTRY MISSIONS

France: Dr. M. T. Morgan (Port of London Authority) now succeeded by Colonel Gaud (late principal medical officer, Morocco).

Belgium: Dr. J. M. Vine (Grimsby).

Holland: Dr. F. Daubenton (South Africa).

Poland: Lieut.-Colonel H. Holle (USPHS).

Czechoslovakia: Dr. G. Lilico (Derby).

Norway: Dr. W. C. V. Brothwood (Lancashire).

Greece: Dr. J. Balfour Kirk (Colonial Medical Service) and, for tuberculosis, Dr. J. B. McDougall (Preston Hall).

Yugoslavia: Dr. H. S. Banks (LCC), with Dr. K. Sinclair-Loutit (casualty MO, Ministry of Health) as deputy.

Albania: Dr. W. E. Thompson (Colonial Medical Service)

Italy: Lieut-Colonel D. A. Reekie (USPHS), with Dr. E. C. Benn (Leeds) as deputy.

PMO, displaced persons, Germany: Lieut.-Colonel N. B. Hon (USPHS).

The following regular officers have been lent to the Administration by the United States Public Health Service: Lieut.-Colonels S. F. Fellows, O. F. Hedley, and D. S. Elliott, and Major M. B. Shimkin. They, together with Lieut.-Colonel Hon, have been working with the medical branch of SHAEF for some six months. All have been entrusted with responsible jobs: for example, Lieut.-Colonel Hedley has been working as chief health officer for Cologne since its occupation. Seven USPHS sanitary engineers have also been temporarily allocated to SHAEF for duty with army groups.

Several senior positions in the Displaced Persons operations in Germany have been earmarked for officers recently retired from the Services, including Major-General R. H. Candy and Colonel J. J. Harper Nelson of the Indian Medical Service, who are already in the field with assembly-centre teams. Mr. T. B. Layton (Guy's Hospital) has been recalled from duty as a district medical officer in Italy to take over a more senior post in Austria.

BELGIAN VISITORS.—A third group of Belgian professors representing the Belgian Fondation Universitaire is now spending a *fortnight in Britain at the* invitation of the British Council.

They are visiting universities or research institutions in London, Reading, Oxford, Cambridge, Newcastle, Aberdeen, Edinburgh, Liverpool, and Greenwich, and the ICI works at Billingham. The delegates include: Dr. A. E. Michotte van den Berck, professor of experimental psychology at Louvain University, Dr. A. E. Gratia, professor of parasitology and bacteriology, Liége University, and Prof. J. A. H. Rodhain, r of the Institute of Tropical Medicine, Antwerp.

In England Now

A Running Commentary by Peripatetic Correspondents

A FEW months ago I went over by night in a little boat from Famagusta to Beirut. I took a car from Beirut and set out for the south along one of the most fascinating roads in the world. Bordered by the Mediterranean on one hand and the mountains of Lebanon on the other, it runs through miles of neatly terraced olive groves, vineyards, and peach orchards. We stopped just long enough at Sidon to glance at the ruins of the castle and buy baskets of peaches. I thought regretfully of Lady Hester Stanhope on her hill a few miles away at Djoun and of all the things I wanted to see in anti-Lebanon, but I had to get to Jerusalem that day if possible. On through Tyre; not a trace of the old city because Nebuchadnezzar was so enraged at having to besiege the place for 19 years that he sacked it utterly, but Alexander's causeway has helped to make an excellent modern road into the present-day city. Then Acre, close enough to see some of the Emperor's earthworks and trenches, and to watch the waves beating against its seaward walls. Haifa has no claim to anything except being built on the slopes of Mount Carmel. I wondered idly on which knob the priests of Baal were slain, as the baggage was shoved into our tired car and we wasted no time in getting away. One does not travel after dark in Palestine unless one has to, so we crossed the brook Kishon at 50 m.p.h. and tore across the plain of Esdraelon all gold in the sunset and studded with little black bedouin tents. Carmel towered over me on the west and far away across the plain I could make out Nazareth on its hilltop, with the round boss of Tabor beyond it. Nothing like Palestine for giving you a sense of déjà vu. Then Jezreel and the mountains of Gilboa. Megiddo on its hilltop all neatly excavated by the *Americans, and through the defile of Jenin on to the* plain of Dothan. By this time I was so dazed with fatigue that I really thought the mountains ringing it round were filled with horses and chariots of fire. I got a backward glimpse of Hermon before the dark came, snowcapped far away to the north, and then we plunged to Nablus past the great gate of Samaria perched on its hillside. Nablus is a sinister-looking little town lying in a deep valley between Mt. Ebal and Mt. Gerizim, and the only Samaritans left in the world—about 150—live there. As it was Ramadan and dusk had now fallen my driver could and did eat while I wandered about looking vainly for a Samaritan or two. I felt that if they had in fact remained pure in blood for 2500 years they ought to be distinguishable, but I had no luck. We reached a blacked-out Jerusalem at 9 P.M. but I must tell you about that another time.

* * *

A few days ago I heard Lord Moran and Stanley Davidson on Medical Demobilisation. Moran's charm and his outstanding ability as a speaker pleased everybody, but I should think that by the time his audience had had time to browse over what he told them they would have little hope of ever getting out of the Army.* There will be more heart-burnings among doctors' wives than among the MOs themselves over this. The women are getting so very tired of managing the business side of the house, keeping in touch with the partners in the practice, and doing all the other jobs which the doctor did before the war—talking to bankers and lawyers and insurance agents and goodness knows who else, against the background of rationing, lack of servants, and so on. It's the MO's wife who deserves the medals, and if she says now and again that it can't go on much longer, who will blame her—or the MO—for getting a little restless? Ah well, life *is* like that.

* * *

The advance party arrived at "Pagoda Grove" at 3 o'clock one hot afternoon, dusty and tired. We had travelled for five days over atrocious roads, climbing mountain ranges 7000 feet high and finally running over the flat and arid plain of Northern Burma. At each halt we were surrounded by a small silent crowd of bedraggled Burmese offering us, in exchange for a single tablet of soap, a big bunch of bananas, eggs, or ten-rupee Japanese currency notes. Their once white clothes were ragged and grey, for there had been no weaving nor any soap made while the Japs were in occupation. The site was a shady palm and acacia grove, and in the middle two lovely pagodas stood up graceful and dazzlingly white in the blazing sun. A third had had the top knocked clean off, and its base was a mass of rubble and twisted gilded metal from the fallen masonry and its once graceful crown. Bells suspended from the canopies of the still intact pagodas tinkled merrily in the light breeze. We explored the ground and gazed dismayed. It was honeycombed with trenches, and, in the middle, a neat white board at the head, lay the grave of Chandra Sing, killed in the recent fighting for the place.

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* More encouraging information is quoted in our leading article this week.—ED. L.

Next morning a businesslike and cheerful Engineer captain arrived and informed us that he was 14th Army and that he was to give us all the help we required. Over a cup of tea the plan of operations was discussed, and later in the day a bulldozer, driven by a cheerful Indian, roared into the site, while the little gods around the pagodas looked on bewildered. In the twinkling of an eye the trenches were gone, hummocks and hollows scooped off and filled in, leaving flat, clear spaces for our tents. There were two deep circular wells in the grove, and presently a van drove in and backed up to one of them. When we came back two hours later a platform of teak had been built over the well, and on this rested a petrol engine, with a long flexible drive attached, which disappeared down into the dark cavern of the well. A canvas tank was next erected and a hose connected to the well. The starting handle was swung, and after a few ineffective kicks the motor caught and roared and a gush of water poured steadily and reassuringly into our tank. The water problem was solved. Two days later the main party arrived. Tents were pitched for our wards, beds laid out and covered with cool blue bedspreads, ovens built for the cooks, and an operating-theatre prepared. In another two days we had 50 patients. They gaped with surprise at seeing real beds in Burma, and with the remark, on first seeing our Sisters, "Gosh, a white woman; it can't be, I must be ill," they lay back in their beds and grinned. Thus it was that the MFHs of the RAF first came to Burma.

* * *

It is high time that somebody put in a good word for the psychiatrists. You really mustn't believe half of what you hear, nor let other people's imaginations run away with you. I have been studying them now for some months and I can, for instance, assure you positively that it's absolute nonsense about their being phosphorescent in the dark. That lie must be nailed once and for all. As has been said before with great truth in these columns, their runcibility could scarcely be higher. The ones I have met all wash regularly behind the ears, are reasonably monogamous, and can put a signature of sorts to any simple typewritten document. (That comes as a bit of an eye-opener, I bet, doesn't it?) And they have terrific fun. The things they say! They are ever so rude, much ruder than you or I could ever hope or dare to be. On the Galahad Scale my strength is as the strength of seven plus, or perhaps eight minus—somewhat higher than the norm. Their average cannot be much more than two minus; but its quite all right because of Freud. And then they contrive to do the things they most enjoy doing nearly all the time; which is very sensible of them and more than most of us can claim. Supposing, for example, a psychiatrist likes mud-pies: he will get everybody to make mud-pies, and after observing 500 chaps making mud-pies he can tell at a glance how well a chap can Handle the Mud-Pie Situation. There's glory for you! Then you know how, if you make a big blot and then fold the paper and squeeze it, when you open it again the result is generally pretty rude? Well, they choose a dozen or so of the very rudest blot-squeezes and confront you with them. Whether you faint or giggle or snort means something quite different, and they note it down and add it up and draw a graph. Some of them adore charades and play them all day long. It's quite all right so long as you call them Psycho Dramas, because that makes them therapeutic.

Personally, being GS 8 – (or at least 7+) and therefore having nothing to fear, I am always ready to play with them. Besides which, having studied them so long, I decided it was only fair to give them a chance to study me, just as a control. Accordingly one day we got cracking on the *Every Picture Tells a Story* test, where you are shown a series of little scenes from everyday life and are asked to explain what's happening. The first picture was of a gentleman with nothing on climbing a rope inside a very large factory chimney. He seemed a bit irresolute, so I hazarded the caption—"Did she say black or white tie? Damn, I shall have to go back and ask." But that couldn't have been the right answer because the psychiatrist wouldn't play any more. He was most psarchastic (if I may coin a word); which was a pity because I had already glimpsed the next picture where a deeply shocked stenographer appeared to be exclaiming "*Really*, Mr. Baldwin!" and I wanted to make sure.

Mind you, there is a limit to their good nature. There are certain little tabus you must respect. Rudery—yes, that's all right, a *sine qua non* you might almost say; but they draw the line at blasphemy. There was, I remember, that silly young trainee who was overheard to murmur, in the little lull before grace at lunch—"I don't believe in the ubiquity of the Œdipal Situation." By teatime he had gone. Unarmed Pioneer Corps, I suppose. Sickening for his people, don't you think?

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

PARLIAMENT met on Tuesday, May 29, with the temporary Caretakers in office and with a stiff breeze of repartee blowing from one front bench to the other. With the end of the war in Europe many hundreds of thousands of workers are eager to go away for a holiday, and it was doubtful whether one polling day, July 5, would suffice. It has finally been decided that polling, in certain areas, may take place on other dates. The [illegible] at the end of July.

The steep rise of 3*s*. 6*d*. a ton in the price of coal has made the mines problem real to many thousands of people. On Tuesday the debate on the Coal Charges Order brought swift conflict between centralised control plus private ownership and straight nationalisation of the mines, and this will be a key issue at the election. There is a big programme of legislation which both sides of the House are anxious to get through before the dissolution on June 15 and this means wholesale sacrifice of this or that beloved amendment on one side or the other.

On Thursday a question to the Minister of Health brought out the fact, now revealed for the first time, that 17,100 medical men and women have been recru [illegible] the beginning of the war up [illegible] on [illegible] tion [illegible] the Services is 21·1%. The Minister was however not able to say how many doctors would be demobilised in the first six months after June 18. Class A men who are general-duty doctors will presumably come out of the Army in regular progression but class B releases are more difficult as is the release of specialists and consultants under class A which to some extent depends on the continued intake of medical men and women of the same category, although not necessarily of the same grade.

The Medical Personnel (Priority) Committee is to continue under the chairmanship of Sir Geoffrey Shake- [illegible] orking under a repre- [illegible] portant are its duties [illegible] en the civilian and [illegible] ation will probably be improved during the next few months by the release of class A. But with the extension in the use of medical services which the war has brought, and our increased civilian responsibilities in Europe, the medical profession will probably find itself with numbers too low for the discharge of all its duties even after the end of the war with Japan.

FROM THE PRESS GALLERY

Health Services in the Coal Mines

IN moving the approval of the Coal (Charges) (Amendment) (No. 1) Order, 1945, in the House of Commons on May 29, Major LLOYD GEORGE said that since the establishment of the war-time control over the mines important welfare measures had been taken with regard to medical services, canteens, and so forth. Since he had been in office he had had no complaints about food for miners, but it was disappointing to find so few workers taking advantage of the canteen. Rehabilitation centres had been greatly increased during the last three or four years, and a pneumoconiosis research centre was to be established. Every preventive measure against this disease that engineering skill could suggest had been taken. Additional doctors had been appointed to deal with it and he hoped that the waiting-list, which at one time was 3000, would be got rid of within the next year.

Dr. EDITH SUMMERSKILL asked how the doctors for the pneumoconiosis service were chosen. She had a feeling that many who had the requisite qualifications had never been approached. But Major LLOYD GEORGE said he was assured that it was not so easy to get the right men for this work. The ordinary tuberculosis specialist could not be regarded as having any real knowledge of this extraordinary disease, but when the war against Japan was ended more doctors would perhaps be available with experience of it. He also hoped it would be possible to set up a proper clinic and establish contacts with other countries where the same disease existed in different forms.

Dr. H. B. MORGAN asked what steps the Government were taking to train young medical men for this work, or to enable older doctors, who were experts in respiratory diseases, to obtain the requisite specialised knowledge? Major LLOYD GEORGE said there was a great shortage of medical men of all categories, and it was with the utmost difficulty that they were able to get men who could be trained. Nevertheless, the panels had been substantially increased and he was hopeful that now the war in Europe had ended it would be possible still further to extend them. Dr. MORGAN also stressed the importance of medical as well as surgical rehabilitation, especially from the point of view of workmen's compensation.

Replying to the debate Major LLOYD GEORGE said the establishment of a medical service was part of the Government's policy set out in the white-paper. In spite of the shortage of medical men a start had been made—he did not put it higher than that. Already there was one doctor at headquarters and another in each region and the Ministry were coöperating closely with the Medical Research Council on the question of the arrears in the examination of men suffering from pneumoconiosis and silicosis. The panels working on these cases had been doubled and a radiological unit had been lent to the Ministry.

QUESTION TIME

Demobilisation of Doctors

Major CHARLES TAYLOR asked the Secretary of State for War whether he could now announce demobilisation plans for officers and men in the RAMC; and if they would be treated in the same way as officers and men in other branches of the service.—Sir JAMES GRIGG replied: The ordinary release regulations will apply to the RAMC as to the rest of the Army. I do not anticipate that the "military necessity" clause will be frequently applied to other ranks and general duty officers. It will probably have to be applied to specialist officers much more freely in view of the overall shortage of such officers and of the difficulty of obtaining from civil life replacements which are likely to be necessary.

Sir PERCY HARRIS: Is not the Minister aware that there is a great shortage of doctors in many parts of the country and will he bear that in mind in making his plans?—Sir J. GRIGG: Quite a considerable number of doctors are due be released under the ordinary working of the scheme. ly to a further question Sir James added: I think that the need of the civil population for doctors is much more likely to be met under class A than class B. It is a new idea to me that it will be necessary to have recourse to class B for doctors.

Dr. HADEN GUEST asked the Minister of Health if he would state the number of medical men and women expected to be demobilised in the first six months after June 18; and whether this number of doctors would be enough to provide for the needs of the civil population.—Mr. WILLINK replied: I am not yet able to give the number. It depends on various factors, including the decision of the Service departments as to whether an officer's retention is necessary on military grounds.

Doctors in the Services

Dr. HADEN GUEST asked the Minister of Health if he would state the number of medical men and women who had been enlisted into the medical services of the Navy, Army, and Air Force from the beginning of the war in 1939 to the latest convenient date.—Mr. H. WILLINK replied: The numbers of medical men and women recruited from Great Britain and Northern Ireland into the medical branches of the Services up to May 24 last are 2405 in the Royal Navy, 12,200 in the Army, and 2564 in the Royal Air Force, making a total of 17,169. The figure for the Army includes a number recruited for work with the Indian Medical Service.—Dr. HADEN GUEST: What proportion do the doctors recruited into the fighting Services bear to the total number of active medical practitioners on the register?—Mr. WILLINK: The proportion of the total number recruited to the total on the register is 27·5%. The proportion of the number recruited to the total number of active practitioners is 31·3%. The proportion of general-practitioners in the Services is 21·4%.

Ministry of Health

Sir GEORGE JEFFREYS asked the Prime Minister whether he would consider changing the designation of the Minister of Health to Minister of Health and Local Government, in view of the fact that it was often not realised that this Minister was responsible for many aspects of local government in addition to health.—Mr. CHURCHILL replied: Personally I never liked the change from "President of the Local Government Board" to "Minister of Health." But I think it would be a great mistake to make another change now.

Medical Personnel (Priority) Committee

Dr. HADEN GUEST asked the Minister the composition of the Medical Personnel Priority Committee; and whether the work of that committee was to be continued.—Mr. WILLINK replied: The Medical Personnel (Priority) Committee consists of a chairman, and twelve medical men representing the several branches of the profession and the Service departments. The committee and its chairman have done most valuable work and there is no intention of bringing it to an end so long as general questions affecting the release and continued recruitment of doctors are still likely to arise for their consideration. The members of the committee are as follow:

Sir Geoffrey Shakespeare, MP, chairman.
Sir Girling Ball, dean of the medical faculty, St. Bartholomew's Hospital.
Prof. J. Crighton Bramwell, dean of the medical faculty, Manchester University.
Major-General R. J. Blackham, War Office.
Dr. J. A. Brown, general practitioner, Birmingham.
Dr. W. M. Knox, general practitioner, Glasgow.
Surgeon Rear-Admiral A. E. Malone, Admiralty.
Air-Commodore D. McLaren, Air Ministry.
Prof. R. M. F. Picken, Mansell Talbot professor of preventive medicine, Welsh National School of Medicine.
Prof. Sydney Smith, dean of the medical faculty, Edinburgh University.
Sir Alfred Webb-Johnson, PRCS.
Lord Moran, PRCP.
Mr. H. S. Souttar, past chairman of the Central Medical War Committee.

Sanatorium Nurses

Mr. R. W. SORENSEN asked the Minister whether his attention had been called to the conditions of nurses in tuberculosis sanatoriums; what was the minimum age for such nurses; how it compared with that for other nursing; if he had particulars respecting the number of nurses who caught the disease.—Mr. WILLINK replied: In cooperation with the Minister of Labour and National Service, I have had under consideration the conditions in a number of sanatoriums. Many are satisfactory, others have defects that could be remedied only by building that cannot at present be undertaken, others are in isolated situations so that the provision of certain amenities is difficult. Such steps as are practicable in present circumstances are being taken to remedy these defects. There is no prescribed minimum age either for tuberculosis nursing or for other types of nursing. It is preferable that girls undertaking nursing should not be under 18 and the Athlone Committee, which reported in 1938, considered that 17 should be the minimum age. Statistics as to the incidence of tuberculosis among sanatorium nurses are not available, but the general opinion of experts is that the sanatorium nurse is at no greater risk than other nurses. An inquiry is in progress under the auspices of the Joint Tuberculosis Council.

Mr. SORENSEN: Is the Minister aware that quite a number of medical experts, including medical officers of health, declare that some of the younger nurses are more prone to catch this disease than the older ones? Will he give an assurance that he will pay particular care to the incidence of this disease among nurses, particularly among young girls, and will he ensure that no girls under 18 are employed as nurses in sanatorium?—Mr. WILLINK: On the first point I am sure that the inquiry will take into account the considerations mentioned. On the second point, he will understand that I must have notice on a question of that kind.

A Parent at Hospital

Commander O. S. LOCKER-LAMPSON asked the Minister whether his attention had been drawn to the neglect of Lady Russell's son in a cottage hospital under his control; and if he would give the name of the hospital and cause an inquiry to be made.—Mr. WILLINK replied: I have seen statements in the medical and lay press on the matter, but I have no clue to the cottage hospital involved.

Release of Medical Consultants' Houses

Sir E. GRAHAM-LITTLE asked the Prime Minister whether he was aware of the shortage, evidence of which had been submitted to him, of houses in the Harley Street area for medical consultants; that this shortage would increase with the return of consultants from war service and was partly occasioned by the continued requisition of 56 houses in the area by Government departments; and if he would take steps to remedy this position as soon as possible.—Mr. CHURCHILL replied: The majority of the houses in the Harley Street area requisitioned by Government departments are used to house American officers so as to reduce the pressure upon the limited hotel accommodation of London; as officers for French missions and branches of the French Embassy; and as hostels. The possibility of reducing the number retained is being examined with the occupying authorities and any houses which can be vacated will be released. Five requisitioned houses now vacant are being released immediately.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED MAY 26

We[illegible] fev[illegible]; whooping-cough, 855; diphtheria, 300; paratyphoid, 3; typhoid, 8; measles (excluding rubella), 11,108; pneumonia (primary or influenzal), 487; puerperal pyrexia, 117; cerebrospinal fever, 50; poliomyelitis, 6; polio-encephalitis, 3; encephalitis lethargica, 0; dysentery, 374; ophthalmia neonatorum, 81. No case of cholera or plague was notified during the week, but there were 6 imported cases of typhus—1 each at Reading, Newbury, Exeter, Braintree, Stratford-on-Avon, and Exeter.

[illegible] Hospitals [illegible] during the [illegible] fever, 47; [illegible]

Deaths.—In 126 great towns there were no deaths from enteric fever, 1 (0) from scarlet fever, 0 (1) from measles, 7 (0) from whooping-cough, 10 (1) from diphtheria, 10 (0) from diarrhoea and enteritis under two years, and 0 (0) from influenza. The figures in parentheses are those for London itself.

An imported case of typhus died at Bradford. There were 5 deaths from diarrhoea and enteritis at Manchester, and 4 at Liverpool.

The number of stillbirths notified during the week was 211 (corresponding to a rate of 30 per thousand total births), including 23 in London.

Letters to the Editor

TRAINING OF NURSES

SIR,—The kindness, technical skill, and good manners necessary for nursing are the same, whether practised in hospital or home, in the chronic or in the acute ward. There are not two ways, first-grade and second-grade, of giving, for instance, a patient a bedpan. But women attracted to nursing as a professional career come from every section of the community and vary greatly in education, natural aptitude, and ambition. What they almost all have in common is a genuine wish to care for patients.

From this it follows that there should be three stages in a nursing career.

In *stage* 1, the pre-hospital period, elementary scientific knowledge relating to the human body and mind and its environment must be acquired and the candidate taught how to observe and record and to develop manual dexterity and delicacy of touch. National organisation of this stage is urgent and should be planned on a regional basis. Teachers and equipment should be of first-rate quality and the length and content of courses depend on the ability and previous experience of the student.

A satisfactory standard having been reached a student then enters on *stage* 2, the period of hospital training proper. It is our opinion that a thorough general training in hospital nursing could be given in two years. We have not a shadow of doubt that if the nurse came into the hospital well prepared and were relieved of non-nursing duties she would get a far more thorough training and give much better service to patients in two years than she now does in three or four. Inquiries show that from 30 to 70% [illegible] verage of from 40 to 50% o[illegible] first two years of training, [illegible] duties. It is a matter of simple arithmetic to see that the training, under the conditions proposed, could be shortened and the standard of nursing raised.

At the end of the two-year period in hospital every nurse shou[illegible] fication and be able to [illegible] rements and the prospe[illegible] to keep her at the beds[illegible] and to compare favourably with prospects in other branches of nursing and other professions. But what we do wish to emphasise is that whatever name is chosen to designate the qualification of the nurse completing her two-year general nursing training all nurses who complete that training should be equally well grounded in the principles of nursing.

The nurse now enters on *stage* 3, the period of professional maturity. For those who wish to continue to work at the bedside without further qualification it should offer the chance to gain experience which will be rewarded by successive salary increments and good conditions of service. But the profession needs sisters, tutors, and administrators, as well as such specialists as midwives and health visitors. For aspirants to these posts stage 3 should be a period of study and experience, securely founded on the general nursing training already received, and lasting for one or two years or even longer. In any scheme it would be necessary to safeguard the title and status of the SRN as now qualified.

If development could be along these lines we believe that many more recruits would come forward and that the 60% wastage during training which now makes nonsense of recruiting campaigns would be much reduced. The inauguration of a National Health Service administered regionally provides the opportunity.

The nursing profession should be responsible for the nursing of all the sick and the foundation of this sense of responsibility should be laid during training.

The loading on to the nurse in training of non-nursing duties; the lack of any conception of the essential nature and scope of nursing; unsuitable teaching; imperfectly trained or too few teachers and poor equipment—all have led to a spiral of longer and longer training and more and more specialties each clamouring for student nurses. Hitherto the teaching of nurses has been largely based on the teaching given to the medical student, suitably diluted and without the dissection and laboratory work which give it meaning. This phase should be left behind and teaching adapted to the specific problems of nursing should be worked out, using all the resources of technological teaching, films, and radio. Nurses now have a sense of inadequacy, not because their training is too short, or because they have not had a few months with each specialty, but because they are rarely taught fundamental principles or how to think. A nursing profession sure of itself, and of the contribution it has to make, would greatly strengthen the medical team. Moreover, the priceless opportunities for observation open to nurses and now usually wasted for lack of knowledge of how to use them might add not a little to medical science.

G. B. CARTER.
London, W2. EVELYN C. PEARCE.

DEMOBILISATION OF DOCTORS

SIR,—All temporary serving [illegible] ill be grateful to the Central Medical [illegible] their letter in your issue of May 26. Not only were all the problems of release soundly treated by a series of questions and answers, but the whole phrasing of the letter was kindly and considerate.

It is stated that “the key to the problem of releasing Service doctors lies in the recruitment of civilian doctors,” and that “the main source of supply is the pool of [illegible] who have completed A or B2 posts [illegible] contend that another important source of supply is the ranks of general practitioners.

In the early years of the war, a fairly large number of general practitioners in the thirties and younger, were rejected, sometimes to their surprise, for health reasons. At that time doctors were relatively plentiful, and their acceptance for service was largely based on their fitness for active service. It is common knowledge that many medical officers have led a sedentary life for long periods of their Service career—indeed much more sedentary than the men who were rejected and remained on in general practice. Now that the European War is over, these rejected doctors could easily carry out duties in military hospitals, reception stations, and ports, and thereby release a corresponding number of doctors according to their age and service groups. Even doctors accepted in category C, providing the disability is not active, and does not require active and continuous treatment—e.g. proved peptic ulceration—could carry out selected duties in this country or on the Continent.

I would suggest, therefore, that all civilian doctors who were at one time rejected for health reason should be examined again, in the light of the new conditions now prevailing. And why limit the proposed call-up to 35–40 years? During the war, far older volunteers were gladly accepted and did a useful job.

One more point. The letter states that many civilian practitioners are being worked to death. It is also a fact that many Service medical officers are being bored to death. Quite obviously, then, an exchange of occupation would be highly beneficial to both sides.

SERVING MEDICAL OFFICER.

SIR,—The general tone of your leader of April 14 is sympathetic but in two places I beg to disagree with your statements:

1. You say that those with field experience will find themselves at less of a disadvantage than they now suppose. I would suggest that the only medical man who has benefited professionally by his Army experience is the young surgeon, who got more surgery than he would have got in peace-time. It is the very opposite with older men like myself and with many physicians whose line of treatment had to be rule-of-thumb as laid down by higher authority—e.g., treatment of malaria and dysentery. I had four years' service in this war as an ophthalmologist and I have almost forgotten what an “old” fundus looks like, or how to do a “cold” cataract operation, or a diathermy for retinal detachment; for owing to the scarcity of apparatus the last type were sent to one hospital.

2. Later in your article you ask, “Why should the medical officer . . . be singled out for early replacement and return to civil life?” This is based on misapprehension. None of us do expect any advantage over any other type of personnel. But we have been told that ctors, dentists, padres, and nurses will *not* be released according to their demobilisation group as determine by age and length of service. On that reckoning I a in group 14 and all I ask is that I be released whe others in group 14 go out; no sooner, but no later.

In each of two wars I have had four years' service as volunteer, and I am now in my 48th year; but as thing stand I can visualise a key man—say a plumber wit only two years' conscript service and much younge than I—being released long before me. A medica officer's exchange with a member of the EMS (preferabl from his home locality) is quite easy, for the civilia can learn all about Army documentation in a few days

CMF. W. D. HAMILTON.

SIR,—The circular letter from the secretary of th British Medical Association published in your issue o May 26, and a leader in the *Times* of May 25, hav reviewed the position as regards reallocation of medica manpower. In both articles stress is laid on the shortag of doctors, but apart from a hint in the *Times* there no suggestion that some economy might be effected the distribution of medical officers among the Force Having served as a “general duties” medical office on land and sea, at home and abroad, for rather mor than five years, I feel inclined to record a few fact relating to this matter.

I will not comment on my employment while abroa nor on the 2½ years at sea when my professional wor occupied on average fifteen minutes a day. Clearly th distribution of medical officers overseas and with oper tional units may require a more lavish scale than th actual routine work warrants. In this country howeve I have served in two non-operational units, for 11 an 8 months, where the medical departments could only b described as wastefully overstaffed. In the one cas four doctors were considered necessary for the care about 1000 Service personnel and the first-aid treatme of about 1500 civilian industrial staff. In the othe case, three doctors were considered necessary for th care of 1800 Service personnel. In both cases fu hospital facilities were available within one hour. quote these two examples as a personal experience, bu inquiry would reveal that they represent the rule rath than the exception.

When these figures (which in addition relate to health adults) are compared with an average general practic it is easy to see why the overworked civilian doctor resen the Service medical officer's claim for sympathy; an why the Service MO views with dismay the demand f yet more doctors in the Forces.

MEDICAL OFFICER.

⁂ We do not know the particular circumstances “Medical Officer's” work, but his experience is certainl exceptional. The subject of these letters is discussed in leading article.—ED. L.

GENERAL PRACTICE A SPECIALTY?

SIR,—Your annotation of May 19 draws attenti to the necessity of raising the standard of medicine practised by the general practitioner, not so much b encouraging each general practitioner to be a part-ti specialist in some other branch of medicine. but b recognising that general practice is in itself a branch medicine in which a very high degree of proficiency ca be attained.

It should be the aim of every general practition continually to be improving himself in this his specialt And there should be opportunity, and easy access the means, for keeping himself up to date, and al incentive, academic or pecuniary or both. I therefo suggest a programme for the continuous postgradua education of the bulk of the medical profession. Thi of the four parts have already been tried experimental in a very small way; the fourth would be a comple innovation and liable to considerable criticism.

1. The introduction of senior students to the atmosphe of general practice, by a course of lectures in their final ye by a seasoned general practitioner. Such a course has bee given at one of the main teaching hospitals at intervals duri the last ten years, and has dealt with ethics, common disea equipment, book-keeping, practice-purchase, National Heal Insurance, dispensers and dispensing, district nurses, relievi officers, and so on. The lectures were well attended, an students have shown great interest by their questions.

to go an unreasonable distance to attend. This has been practised in at least one EMS hospital during the war. Cases of unusual interest can be shown. It gives doctors an opportunity of looking up their cases, and it could give exactly the right chance for the Ministry of Health to suggest a text for study in the shape of topical epidemics such as infantile paralysis or epidemic hepatitis, and for teaching on the use and abuse of sulphonamides. A regular feature should be the explanation, and administration, of the routine laboratory tests that the general practitioner uses or should use in diagnosis, by the local pathologist, with examples of good and useless specimens, and advice and practical instruction on how and when to take them.

3. Each county should form an epidemiological committee, as has been in use in one county for several years. The members consist of the county medical officer, three pathologists, a representative of the Ministry of Health, several medical officers of health, superintendents of hospitals and sanatoria, and two general practitioners—about twelve altogether. They should meet each month with the object of discussing the prevalence of epidemics and preventable illness in the county, and can circularise practitioners and help them considerably in simplifying the diagnosis and treatment of early cases. There could be a close link between this committee and the teaching rounds

4. A
medicine
increase
general
ably late
listen to
balance the good it could do to his doctor.

Finally, as to incentive. Academically, a Diploma in General Practice. If this were made to carry sufficient weight, it could easily achieve the object of keeping the practitioner in touch with modern medicine. To do this there should really be re-examination at intervals. A much more sordid, but obviously much more efficient, way, would be to make a portion of the capitation fee in the future National Medical Service dependent on regular attendance at so many weekly teaching rounds per year. I know that suggestion will raise a storm of protest, but the fact remains that there are many doctors who depend for their knowledge of modern advances in medicine on the breakfast-table literature of enterprising chemists, and who defini
the most efficient treatn
It is a position which we
to do that means to take immediate steps to remedy it.

Great Dunmow. GEOFFREY BARBER.

RELEASE OF VITAMINS BY THE INTESTINAL FLORA

SIR,—In your annotation of June 2 you criticise some remarks of mine made at a meeting of the Biochemical and Nutrition Societies. I raised the question whether the B vitamins synthesised by the flora of the human gut are available to the host. I did not, as you

and against it in the
ly gives the evidence for absorption and quotes mainly
imal work. You do not mention the recent paper of lexander and Landwehr (*Science*, 1945, 101, 229), which they describe experiments showing that in uman fæces the vitamin B_1 synthesised by the bacteria the gut is largely within the bodies of the bacteria d therefore may not be absorbed and utilised. They lso produced evidence to show that vitamin B_1 is not bsorbed from the large gut when administered per ectum in physiological amounts. My concluding marks at the meeting were, "the subject obviously equires further investigation." In view of our present canty and conflicting knowledge on the biosynthesis nd absorption of the B vitamins in the human being, think that this critical attitude is justified.

Wellcome Research Institution. F. PRESCOTT.

*** The annotation of June 2 should be read as a upplement to the leading article, *Synthesis of Vitamins n the Bowel*, of Dec. 30, 1911.—ED. L.

TENDON SUTURE

SIR,—The method of tendon repair with metal
bed by Mr. McKee (May 26;
eresting; seems to be unneces-
disadvantages that I see in this
method are: (1) the introduction of a foreign body; (2) the need for a second operation 3–5 weeks later to remove it; and (3) the enforced *complete* immobilisation of the fingers between the two operations.

The method I have been using for the past nine months depends on the same principles, but the material I use is fascia lata. The advantages are: (1) it is a living tissue, being in the nature of a "fascial graft"; so (2) there is no need for a second operation; (3) there is no danger of adhesions, because the junction of the cut ends of the tendon is covered by the fascia; and (4) active finger movements are permitted *from the day of operation*—thus preventing the stiff interphalangeal joints often seen after immobilisation of the fingers.

In the cases for which I have used this method of tendon repair, not only has the end-result been satisfactory but the time off work has been very short. Among these cases have been two severed extensor pollicis longus tendons and a cut tendo achillis (in a girl of 17 years who caught her heel on a tin plate projecting from a low shelf). The first two patients were back at work 3 weeks after operation. The third was walking in a plaster for 6 weeks, and then started on active ankle exercises; 9 weeks after operation she was walking well, and when last seen it was impossible to tell which leg had b

I
flex
well sutured. In a case similar to his 4th and 6th cases (in which all the flexor tendons at the wrist had been severed, as also was the median nerve), I sutured all the tendons, using Burnell's method. Recovery was complete, as shown by the fact that the patient—a semi-professional pianist—played at a concert 3 months after his accident, and has since been passed as A1 by the medical board for entry into the Fleet Air-Arm.

King George Hospital, Ilford. PHILIP HOPKINS.

CUTANEOUS GANGRENE

SIR,—The postoperative cutaneous gangrene described by Grimshaw and Stent (April 7, p. 434) and the idiopathic gangrene of the scrotum described by Mair (April 14, p. 464) are both likely to be examples of the postoperative progressive bacterial synergistic gangrene of Meleney, which he believes is due to a staphylococcus plus a micro-aerophilic non-hæmolytic streptococcus, acting in combination. Meleney recommends a special *active* preparation of zinc peroxide as a therapeutic application. Grimshaw and Stent found penicillin effective. Both the special zinc peroxide and penicillin are at present difficult to obtain. An effective substitute which is generally obtainable is finely powdered crystals of potassium permanganate, which are applied to the lesion in a thin powdering and covered with sterile "Vaseline" gauze and a suitable supporting dressing. The method is described at some length in *Trans. R. Soc. trop. Med. Hyg.* for March, 1915 (p. 259).

FRANK MARSH.

FAMILIAL SPASTIC PARESIS AND Rh SENSITISATION

SIR,—Crowe has described a family of five children of whom all showed spasticity and adductor deformity of the lower limbs, with mental retardation, and four also had strabismus (Crowe, M. P. *Arch. Dis. Childh.* 1911, 19, 32). The mother also had three miscarriages, one before the birth of the first child, one between the second and third, and one after the last child. No cause could be found for the lesions—the blood Wassermann reaction was negative in both parents and all children—and Crowe attributed them to an inherited recessive character.

I have since examined the blood of both parents and the four oldest children to find whether the Little's disease was connected with maternal sensitisation to Rh antigens. The Landsteiner blood-groups of the father, mother, and two of the children were A1, the other two children being of group O. The Rh antigenic constitution of all was 456·456. They were therefore all "Rhesus-negative." The mother's serum showed no irregular antibody at 37° C, at room temperature, or at 4° C. Rh sensitisation can therefore be eliminated as a cause of Little's disease in this family at least.

EMS Laboratory, Stoke Mandeville,
Aylesbury.
JOHN MURRAY.

"FLOUR OF GOOD COLOUR"

SIR,—Four times in their article on the Scientific Basis of 80% Extraction Flour (June 2) Dr. T. Moran and Sir Jack Drummond—both of the Ministry of Food—assert or imply that, in bread, a pale colour is "good" and is desired by "the consuming public," the "bulk of the population."

This view was heard before, when the Ministry of Food was seeking to justify the change from 85% to 80% extraction. As a lofty structure of assay, microanalysis and statistical study is being reared by Government research workers upon the contention that a pale colour in bread is better and more desired by bread-eaters than a darker colour, it is important to know if the contention is true.

What is the evidence? Is it statistical? If so were those forming the sample informed of the difference in content between pale and darker-coloured bread or was their view solely concerned with the look of the loaf? I know many bread-eaters who prefer darker-coloured bread. How is it that the two distinguished authors are so certain that these people are in a negligible minority?

Dr. Moran and Sir Jack Drummond do not argue that paler bread is the more nutritious—unless the reader is meant to hold the graph on p. 699 upside down—so the large effort that is being devoted to making it paler is being expended to satisfy a tint preference which, it is said, is exhibited by the "bulk of the population." Before we go any farther in this matter, that alleged preference for paleness, it seems to me, should be scientifically demonstrated.

Outwood, Surrey.
OLIVER STEWART.

On Active Service

CASUALTIES

MISSING PRESUMED KILLED

Surgeon-Lieut.-Commander R. G. DINGWALL, OBE, RN, HMS *Gloucester*.

AWARDS

DSO

Colonel G. M. WARRACK, LRCPE, RAMC

MC

Captain H. A. COLE, MB SHEFF., RAMC
Captain A. C. V. JONES, MRCS, RAMC
Captain MAXWELL LERNER, RCAMC
Captain E. H. WILLIAMS, MB LOND., RAMC
Captain STEPHEN WOROBETZ, RCAMC

OBE

Colonel A. K. HUNTER, RCAMC
Colonel G. A. SINCLAIR, ED, RCAMC
Major D. A. YOUNG, RCAMC
Colonel H. G. YOUNG, DSO, MC, ED, RCAMC

MEMOIR

IT is now known that Surgeon Lieutenant H. E. DUNNING GALE, reported missing two years ago, was killed during the assault on Dieppe in 1942. Born in Monmouthshire in 1907, Gale qualified at St. Bartholomew's Hospital in 1934. From the first his keenness for the scientific side of medicine was apparent, and his work with Graham Weddell on changes in the blood-sugar level associated with surgical operations was published in the *British Journal of Surgery*. As house-physician to Dr. George Graham, he found he could blend his love for the laboratory with his interest in clinical medicine, and this was one of the happiest years of his life. Later as demonstrator in anatomy under the late Prof. H. H. Woollard and Prof. W. J. Hamilton he gave valuable service when the department was being transferred from *the hospital* to Charterhouse Square, and in spite of heavy teaching duties he still found time to do research.

"Gale and I spent many evenings together," writes G. W., "probing into the unknown with the scientific method as our only weapon; for in those days a corpse, a scalpel, and a pair of forceps were considered sufficient armament for an anatomist. He began some work on tissue culture and soon produced many successful cell colonies—no mean feat, for he was working under primitive conditions and had not even the advantages of air-conditioned atmosphere."

After three years in the anatomy department Gale found that "teaching was not enough," and in 1938, to the surprise o all but those who knew him well, he put his plate up in genera practice in Bolton Gardens, SW10. In a few months he equipped a clinical laboratory that was the envy of his colleagues, and in one short year he must have done more first class clinical biochemical work than has ever been done before by a general practitioner, often working late at night, on top o all the manifold tasks demanded of him by a busy panel and private practice.

In 1940 Gale joined the RNVR and he was stationed on the south coast during the Battle of Britain. So often was he firs on the spot when a machine crashed or a pilot baled out tha the police used to say, "When we see the Doc in a hurry we get out the ambulance or fire engine and do our best to follow his car." He volunteered for service with the Marine Commandos. At Dieppe he had a chance of getting back safely bu he decided to stay with his wounded. Later he ran out from across a fire-swept breach to some wounded Canadians at the edge of the water, and there he met his death.

J. H. H.

Obituary

WILLIAM LOGAN SCOTT

MC, MD GLASG.

IT is little more than eighteen months since Dr. W. L Scott succeeded his former chief, Sir Henry Bashford, as chief medical officer of the Post Office and became his deputy as medical adviser to the Treasury. His interes in occupational medicine began early, for his father. Dr Alexander Scott, of Tollcross, Glasgow, was surgeon to a Clyde ironworks and colliery and in 1887 had published a paper on the prevention of chronic lead-poisoning. The son, born in 1888, was educated at Glasgow High Schoo and University (where he graduated MB in 1911) and at University College, London. He held resident appointments at the Royal Infirmary, Sheffield, for two year before coming to London in 1913 as an assistant medica officer at the Chelsea Infirmary and later at the North Western Fever Hospital. For the whole of the last war he served with the RAMC, and he was awarded the MC On his return to civilian life in 1919 he was a medica member of a pensions appeal tribunal until in 1921 he joined the medical branch of the Post Office. In 1934 he rose to second medical officer of the service, and he attained the senior appointment in 1943.

The Post Office employs over a quarter of a million workers, and from its unrivalled collection of attendance and sickness records Dr. Scott drew valuable conclusion on the economical use of man-power. Through old fashioned methods of quarantine thousands of working hours are lost yearly, and in his article on the contact in industry, published in these columns in 1937, he triumphantly vindicated the Post Office's established policy o allowing healthy contacts of most infectious diseases to remain at work. Scarlet fever was at that time one of the few exceptions, but four years later he described how this quarantine had also been safely removed. The findings thus recorded had a very considerable influence on public-health practice. Another series of papers written in collaboration with his chief, assessed the working capacity of patients who returned to the considerate employment of the Post Office after recovering from gastric or duodenal ulcers, from pulmonary tuberculosis and after thyroidectomy.

H. H. B. writes: "Dr. Scott's death will be most deeply deplored by the whole department, which he had so faithfully served for more than a quarter of a century both as clinician and administrator. He brought to his work a gay and breezy common sense, combined with a very wide and practical knowledge of his profession. He was the most delightful of companions in bright hours and dark, with an original wit and good spirits that never flagged; and he was the soul of kindness to all in trouble."

He died at Winchester on June 1 after a short illness.

Notes and News

AN INTERNATIONAL HEALTH ORGANISATION

DELEGATES on the Committee on Economic and Social Coöperation at the San Francisco Conference have suggested the establishment of an International Health Organisation The proposal was made by delegates from China and Brazil and was warmly supported by representatives of Australia, United Kingdom, Norway, the United States, France, Egypt, Canada, the Soviet Union, Belgium and many smaller nations No opposition was expressed

In an interview after the committee s meeting, Dr Szeming Sze, the Chinese delegate, said that a new International Health Organisation should centralise and coordinate existing bodies, including the Pan American Sanitary Bureau, the Office International d Hygiène Publique in Paris, and the remnants of the League of Nations Health Organisation, including the Far Eastern Bureau at Singapore in the Australia Pacific zone It was the hope of health officials that the United States would call a conference within the next three months, when the new organisation could be created Emphasis would be placed first on the control of epidemic diseases and the establishment of an epidemiological intelligence service

Another function of the new organisation would be to provide field missions to help distressed nations in case of war or disaster Dr Sze further hoped that it would undertake international planning of postgraduate medical training extensive exchange of students through a programme of fellowships establishment of a system of international grants for developing health work in backward countries, and the drafting of sanitary conventions It should also try to coordinate the operations of the Secretariat for International Pharmacopœia, the International Body for Standard Medical Nomenclature, and other related organisations Its ultimate aim would be the distribution of the best possible health knowledge to the countries where this was needed most

Dr Sze is chief of the Far Eastern Health Section of UNRRA and a member of the National Health Administration of China

A MISSING CHILD

ON April 16 a boy aged 8½ months was stolen from a pram Oxford Street, London His clothing was found on the same day in a neighbouring water tank but the child is still missing As he may be in need of medical attention, practitioners are asked to keep a watch for him He is described s being well nourished, with dark sparse hair, brown eyes, a vaccination mark on the left arm, and a rash mark near both temples and on the back of his head he has been circumcised and the top of his left ear is turned down A photograph has been supplied to every London police station and to all county police forces Information will be gladly received by the detective inspector D division, 104, Albany Street, London NW1 (tel Euston 1113)

THE LEBANON HOSPITAL

DESPITE great war time difficulties which have included soaring prices and shortage of staff the hospital for mental diseases at Asfuriyeh in the Lebanon has not only carried on with its work but plans a new venture At the 16th annual meeting, held in London on May 16 Mr Lyn Harris who presided, said that in the next few years the committee hope to found a sister hospital for the treatment of nervous disorders Thus the beginning of a complete service for the care of mental and nervous illness will have been established in the Lebanon and will no doubt grow to meet the country s [illegible] Dr Stewart Miller the medical director, reports that during the last year the hospital has admitted 361 patients, 16 of them military, and 35 on behalf of UNRRA, in all there were 517 under treatment, of whom 92 were discharged recovered and 83 discharged improved The recovery rate is rather lower than usual because the pressure on accommodation has led to the discharge of more patients who though improved have not recovered fully

*Two aspects of the Lebanon Hospital are specially note*worthy Mr Nadim Dimechkie representing the Lebanese Minister said of it that the Lebanese regard it as being different from most foreign institutions of which there are many in the Lebanon These—schools, universities colleges, and mission schools—all have a foreign touch, he said but the Asfuriyeh hospital is felt to be an exception—a genuinely philanthropic venture built to the glory of God It is also exceptional in being a mental hospital without imprisoning outer walls Dr Jack Smith who, as son of a former medical director, grew up there, said that there had never been any walls to keep the patients hemmed in The hospital has been a pioneer in occupational therapy, and has developed the unusual practice of allowing patients who are getting better to help in the care of those who are not so well In this country a patient is never seen in charge of a group of other patients, yet patients can be prepared, by this responsibility, for resuming life in the outside world, and many of those at Asfuriyeh have spoken of the confidence it gave them

The heavy future commitments of the hospital, as well as the inflation of currency, make
ever Contributions may be s
Hospital for Mental Diseases, D
London, WC1

University of London

At the end of this session under the age limit, Prof M Greenwood, FRS, is to retire from the chair of epidemiology and vital statistics at the London School of Hygiene Owing to a change in the distribution of teaching *and steady increase* in the volume of research work and teaching within the field of medical statistics the title of the chair has been altered to that of medical statistics and Mr A Bradford Hill, DSC, reader in medical statistics in the university since 1933, has been appointed to fill the vacancy The senate has conferred the title of professor emeritus in epidemiology and vital statistics on Dr Greenwood

Royal College of Surgeons of England

H R H the Duke of Gloucester, who is himself an honorary fellow of the college, bestowed the honorary *fellowship on Sir* Hugh Devine, a founder and past president of the Royal Australasian College of Surgeons, at Government House, Melbourne, on Feb 23 ir Alan Newton, FRACS, Sir Henr Hailes, Air Vice Marshal Victor Quick (members of the RACS co ambert Rogers Sir Alan Newton, referring to the close association between the English and Australasian colleges, said "We shall do everything in our power to foster this association More than 200 Australian and New Zealand surgeons were *fellows of both, and we hope that our young men* will continue to present themselves for this diploma in England, and thus absorb some of the noble spirit of Britain and the traditions of British surgery We hope, also, to see many more British surgeons visit us The Duke of Gloucester spoke of the esteem in which the Australasian college is held in England, and especially of the high regard felt for Sir Hugh Devine's own contributions to the advancement of surgery

Two Hunterian lectures will be delivered at the college, Lincoln's Inn Fields, London WC2, at 4 PM on June 13 and 14 *On Wednesday, the 13th, Air Vice Marshal Geoffrey Keynes* will speak on the surgery of the thymus gland, and on Thursday, the 14th, Colonel Elliott Cutler on Military Surgery, US Army, 1944–45

Society of Apothecaries of London

Dr R J Mitchell was successful in the recent examination for the mastery of midwifery

Royal College of Obstetricians and Gynæcologists

At a meeting of the council on May 26, with Mr Eardley Holland, the president, in the chair, the following were *admitted to the fellowship and membership*

Fellowship—C [illegible]lin R J Kellar
Meave Kenny, F R G S Allan
A M Hill J J Kean Mayes H K
Pacey Frank Stabler

Membership—Amelia F Burch F G Collins Jadwiga Karnicki Gladys I Keith Dorothea M Kerslake Dorothy M Shotton R G G Sykes and (in absentia) J P O Erskine A B Hay, Sybil G Mocatta, and Dorothy J Thompson

At the annual general meeting Mr Malcolm Donaldson was elected to the council as a representative of the fellows, and Mr D B Fraser as a representative of the members

National Association for the Prevention of Tuberculosis

On May 31 a deputation met the Secretary of State for the Colonies to discuss the possibility of further tuberculosis surveys like the recent one in the West Indies, the provision of NAPT scholarships to colonial health officials for study in this country and the development of anti tuberculosis propaganda in the Colonies The deputation included Dr R A Young, Colonel Walter Elliot MP, Prof Lyle Cummins and Dr F H Harley Williams

University of Edinburgh

Dr. Charles Cameron, medical superintendent of the South-East Counties of Scotland Sanatorium, has been appointed to the chair of tuberculosis which has been vacant since the death of Sir Robert Philip in 1939.

Dr. Cameron, who graduated MB with honours at the University of Glasgow in 1911, served as a captain in the RAMC in the last war. As an assistant MOH for Glasgow he had experience of public-health work before he was appointed superintendent of the Ochil Hills Sanatorium at Milnathort, and when the South-East Counties Sanatorium was opened at East Fortune 22 years ago he was appointed to his present post. The previous year he had obtained his MD with commendation and had been elected to the fellowship of the Royal Faculty of Physicians and Surgeons of Glasgow. In 1941 owing to the war the East Fortune sanatorium had to be moved to a block of wards in the emergency hospital at Bangour and Dr. Cameron became director of the tuberculosis department of that hospital under the EMS. His published work includes a paper on the point of entry in tuberculous infection (*Lancet*, 1934), and a study of meningeal tuberculosis as a terminal feature of pulmonary tuberculosis (*Edinburgh Medical Journal*, 1935). He is a past president of the Tuberculosis Society of Scotland.

Society of Medical Officers of Health

Prof. J. Johnstone Jervis, medical officer of health for Leeds, has been elected president of the society for the session 1945–46.

Association of Port Health Authorities of the British Isles

The association is holding its 46th annual meeting on June 14 and 15 at Cardiff, when Alderman Edgar Chappell will give a short historical retrospect of the port and Mr. D. G. Hoppins will describe its work in war-time. Mr. J. W. Wellwood of the Ministry of Labour and National Service will speak on the welfare of merchant seamen in ports, and Colonel P. G. Stock, FRCP, will read a paper on the International Sanitary Convention of 1944. Visits will also be made to the docks, including the seamen's baths and the cold food store, to the Royal Hamadryad Seamen's Hospital, to Llandough Hospital and to the Merchant Navy Club.

Royal Society of Medicine

At a meeting of the section of experimental medicine and therapeutics on Tuesday, June 12, at 5 PM, Dr. E. P. Sharpey-Schafer and Dr. John McMichael will open a discussion on cardiac output in congestive failure. The section of psychiatry will meet at the same hour, when Dr. C. J. C. Earl will read a paper on defective constitution. Dr. E. B. Strauss and Dr. W. Linford Rees will open the discussion which is to follow. On June 15, at 5 PM, at the section of obstetrics and gynæcology, Mr. Ivor Hughes will speak on congenital defects following rubella in pregnancy. Dr. Kathleen Vaughan, Mrs. Guthrie Smith, CSMMG, Sister Randall, and Mr. Dick Read will open a discussion on massage and exercise in pregnancy and the puerperium.

The Post-war Loaf

The Food Education Society has expressed its regret that the Government have reduced the extraction-rate of the wheat grain for bread flour to 80% on inadequate scientific and clinical data, especially at a time when the position in regard to food-supply in general is so uncertain. "There is good reason to think that any reduction below 80% would be detrimental to the health of the people, and should not be put into effect without further enquiry and experience." The society holds that a specification for the post-war loaf is highly desirable.

Mrs. E. C. Pillman-Williams, MB, chemical pathologist to the Royal Free Hospital, has been appointed hon. medical secretary of the society, and Mr. Eric Murdock, PHD, hon. general secretary.

Society for the Relief of Widows and Orphans of Medical Men

At the annual general meeting on May 23 with Dr. R. A. Young, the president, in the chair, Mr. W. Gilliatt was elected a vice-president and Air Commodore R. R. Trail and Mr. G. T. Mullally directors. During 1944 the sum of £5125 was distributed in grants among 55 widows; one of whom has now received £1925 for herself and her son. A legacy of £5000 was received from Dr. Charles Reid, of Stafford. The number of members during the year was 287: 3 were elected, 1 died, and 1 resigned. Membership is open to any registered medical man who at the time of his election is residing within 20 miles of Charing Cross, and relief is granted to members' widows whose income is £125 or less. Particulars may be had from the secretary, 11, Chandos treet, London, W1.

Reablement in EMS Hospitals

On May 30 the Minister of Health, Mr. Willink, receiving representatives of the British Council for Rehabilitation, said that more than 11,000 patients in Emergency Medical Service hospitals were now taking daily courses of remedial exercises in their beds. In addition 20,000 were attending hospitals daily for special exercises and remedial games. Of these 31,000, 15,000 were taking part in some form of occupational therapy. The number of hospitals providing rehabilitation had increased to 300, and the great majority of Service sick and wounded were receiving their medical rehabilitation in EMS hospitals. More than 250 doctors have been given special training.

CORRIGENDUM: MAJOR CLARKSON.—In the concluding sentence of the paper by Captain Rex Lawrie in our issue of May 19 (p. 625), which was not seen by the author in proof, reference is made to "the late" Major P. W. Clarkson. We are glad to say that this description is unfounded and that Major Clarkson is very much alive. The mistake, which we regret, arose from misreading of an amendment to the text.

Appointments

DODDS, G. R., MB DURH.: examining factory surgeon for Masham, Yorks.

DOYLE, J. O, MB NUI: asst. physician, Liverpool and District Hospital for Diseases of the Heart.

ENGLANDER, OTTO, MD PRAGUE, MRCS, DMR: radiotherapist, Royal Infirmary, Leicester.

FRANKLIN, A. W., MB CAMB., FRCP: asst. physician, Hospital for Sick Children, Great Ormond Street, London, WC1.

GREEVES, N. M., MB DUBL.: examining factory surgeon for Blackburn South district.

KING, E. F., MB BRIST., FRCS, DOMS: ophthalmic surgeon, Westminster Hospital, London.

NEWNS, G. H., MD LOND., MRCP: asst. physician, Hospital for Sick Children, Great Ormond Street, London, WC1.

ROSENTHAL, R., MD PRAGUE: RSO, Coventry and Warwickshire Hospital.

WALKER, G. O., MRCS: examining factory surgeon for Lees, Lancs.

Births, Marriages and Deaths

BIRTHS

DAVY.—On May 28, at Towyn, the wife of Surgeon Lieutenan B. W. Davy, RNVR—a son.

EDWARD.—On May 20, at Cardiff, the wife of Dr. D. G. ff Edward—a son.

MCCALL.—On May 25, at Stoke-on-Trent, the wife of Dr. A. J. McCall—a daughter.

MAHER-LOUGHNAN.—On May 18, in London, the wife of Dr. G. Maher-Loughnan—a son.

ROSS.—On May 25, at Forfar, the wife of Surgeon Commander David Ross, RNVR—a son.

RUSBY.—On May 19, at Hertford Heath, to Dr. Elizabeth Rusby (née Broadhead) wife of Major Lloyd Rusby, RAMC—a son.

STANNING.—On May 16, at Hordle, Hants, to Dr. Kathleen Stanning (née Gillett) and Commander (S) John G. Stanning, OBE, RN—a son.

MARRIAGES

CAMPBELL—COXALL.—On May 26, at Farnham, Surrey, Douglas J. Campbell, FRCPE, lieut.-colonel, RAMC, of Edinburgh, to Florence Louise Coxall.

MILTON—MURPHY.—On May 23, at Maidenhead, Roland Milton, MRCS, to Joan Murphy.

DEATHS

BAILEY.—On May 28, at Leicester, John Moray Bailey, MRCS, aged 46.

BALEAN.—On Jan. 19, at Stanley Internment Camp, Hong-Kong, Hermann Balean, MD LOND., FRCS, aged 69.

CHILD.—On May 27, at Billingshurst, Sussex, Stanley Child, M MB CAMB.

HARRIS.—On May 27, at Farnborough, Hants, St. George E Harris, OBE, MD DUBL., captain RAMC, aged 68.

IRWIN.—On May 30, at Cheddar, Somerset, Stewart Irwin, MB EDIN aged 78.

JOHNSON.—On May 31, at Brenchley, Kent, John Robert John- MRCS.

LAWSON.—On May 27, at Leicester, Robert Sharp Lawson, MB EDIN FRCS.

LORRAINE.—On May 12, Joseph Currie Lorraine, MD EDIN., FRCS of Montpelier Square, London, SW7, aged 58.

MILLN.—On May 30, George Herbert Stephens Milln, MB EDIN., o Dundee.

SCOTT.—On June 1, at Winchester, William Logan Scott, MC MD GLASG., aged 56.

STOWE.—On May 29, in London, William Raymond Courtenay Stowe, FRCS, DMRE, aged 44.

WILLIAMS.—On May 31, John Frederick Williams, MRCS, DPH of London, aged 87.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

HEALTH OF FOUR HUNDRED MILLIONS

J. N. MORRIS, M A GLASG., M R C P, D C H
LIEUT.-COLONEL RAMC

THE famine of 1943, the 400,000 deaths from cholera in that year, and the appointment of a Health Survey and Development Committee by the Government of India have focused attention on the condition of the people of the Indian sub-continent, who constitute eight-tenths of the population of the Empire and almost a fifth of the people of the world. The Bhore Committee will, for the first time, permit of a total view of the situation. Meanwhile, its main contours are clear enough despite the poverty, inaccuracy, and inaccessibility of vital statistics (*a*). Grant,[17] in his Oxford pamphlet, sums up:

> The level of health of India is low. Preventable epidemic diseases such as smallpox, typhoid, dysenterics, cholera and malaria are widespread . . . Tuberculosis is spreading and each year presents a more menacing problem. The resistance of the population to disease is low. Malnutrition and nutritional diseases are omnipresent . . . The heavy incidence of disease is reflected in the high mortality figures.

Figs. 1–8 provide some illustrative material. The expectation of life (fig. 7) and other mortality data for present-day India are not dissimilar from Western experience before mortality began to fall in the latter part of the 18th century.[30] The crude death-rate for India (fig. 4) corresponds with, for example, the English figures before the modern public health movement got into its stride in the sixties and seventies; the birth-rates (fig. 1) resemble those of England and Wales before the decline in fertility set i
pattern (fig. 3) is similar
hundred years ago, but
higher for children and lower for old people.

MOTHERS AND CHILDREN

Excess mortality is at its highest in infancy which may be further evidence of sensitiveness at this epoch to environmental stress (table I, fig. 6).

TABLE I—CHILD MORTALITY[43 50 52] (UNDER 1 YEAR) PER 1000 LIVE BIRTHS, AND (1–15 YEARS) PER 1000 POPULATION LIVING

Age	Bombay 1938–42	England and Wales 1938	Glasgow 1939–41
Under one week ..	49	21	..
Total neonatal.. ..	85	28	42
4 weeks–6 months .	62	16	53
6 months–1 year ..	71	9	
Total infant mortality	218	53	95
1– 2 years	92*	8·6	..
2– 5 " ..	26*	3·3	..
5–10 " ..	6·9*	1·9	..
10–15 " ..	4·7*	1·2	..

* Estimated from Census of India, 1941, vol. III.

of
un
be
in the provinces from over 100 to over 200 with an all
In the cities (fig. 2) the
the figures probably more
38–43) the rate averaged
in Karachi (1930–41) 134, and in Cawnpore (1912–43) it was as high as 321. In Calcutta (1930–41) recorded rates in the different wards of the city range
may mean); in
children just un

Table II suggests, for Bombay and Calcutta, that "communal" influences may be operating alongside all the other factors. The social status of the Moslem community in Calcutta is, however, so inferior to that in Bombay that no definite conclusions can be drawn on the effects of Purdah, &c.

TABLE II—INFANT MORTALITY IN INDIAN COMMUNITIES

Community	Infant mortality		Birth-rate (per 1000 pop.) Bombay 1943
	Calcutta 1942–43	Bombay 1943	
Hindus	167	193*	24*
Untouchables ..	..	261	50
Moslems	337	181	30
Indian Christians ..	170	193	39
Parsees	..	84	16
Europeans	..	52 (1941–43)	23

* Other than untouchables.

Whether these children are better dead, and India the better for it, are not propositions that can seriously be debated. The welfare movement, in 40 years, has made a start:—

	Registered births	Welfare centres	Health visitors
1938 England and Wales	621,204	3580	2653
1939 India	9,346,145	1021	352

point out, "too small to meet the demands for their services." How richly welfare work is rewarded may be judged from Madras where an energetic municipality has already attracted about 40% of mothers to its clinics:—

	Mortality	
	Maternal	Infantile
Madras City rate (av. 1941–43)	8 2	218
M and CW scheme rate ..	2 7	107

A little arithmetic shows that the infant death-rate among the majority who were not reached was close on 300 per 1000.

Is progress being made? Absolutely, yes. Relatively, the answer is, apparently, no.[5] The registered infant death-rates for British India today are probably higher than those of England and Wales have ever been (table III).

TABLE III—INFANT MORTALITY: 30 YEARS ADVANCE

Years	British India	England and Wales	Ratio
1912–15 ..	204	102	2·0
1917–21 ..	217	89	2·4
1922–26 ..	181	73	2·5
1927–31 ..	176	67	2·6
1932–37 ..	173	61	2·8
1938–42 ..	Over 160 (estimated)	53	Over 3

MATERNAL MORTALITY

Maternal mortality again varies widely, with an all-India rate of approximately 20 per 1000.[4] Deaths falling within the province of maternity and child welfare thus add up to more than half the total mortality. In progressive Mysore the gradient is steep, from 3 3 in a "model" Rockefeller-subsidised district to approximately 39 in certain rural areas. In Bombay, where
tutional (in contrast with
is under 30) the mortality
1000 live births, less than
half that for "other races" (other than whites) in USA,

(a) T

birth rates are underestimates by as much as 25%. It should be remembered also that death certification in India is largely done by lay officials (e g. the village headman), and often is no more precise than a label of "fever" or "diarrhœa."

1938, though for technical reasons comparisons are of very limited value.[14] But while maternal care in Bombay can record this gain it must be remembered that in all India there are as yet less than 10,000 trained midwives and dais. Maternal mortality, moreover, is only one expression of the cost of childbearing. In England male death-rates are mostly higher than female while, in India, this is true only under 10 years of age and over 40. Between 15 and 40—the reproductive period—female death-rates exceed those for males. At 10–15 they are equal.

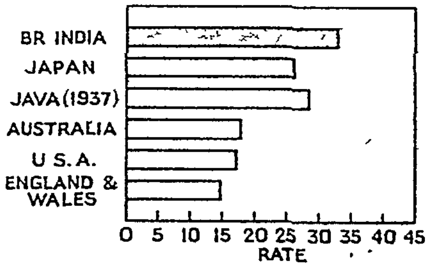

Fig. 1—Some national birth-rates per 1000 population, 1939.[43]

For the most part the organisation of the school medical services is rudimentary. The crux of the matter is the disposal of the children—60–70% of all children—found to be physically defective at inspection.[11]

MALNUTRITION

As may be imagined, it is difficult to assess the average income per head in India. The standard pre-war estimate [40 41] was Rs.65 a year—less than 2s. a week and about 1/15th of the level in the United Kingdom (b); and even this pitifully low income is reduced by the almost universal burden of indebtedness. The consequent denial of elementary human needs is the outstanding impression on Western visitors. The minimum rental of a home " fit for an ordinary family " was estimated in 1939 at Rs.60 a year in Delhi province, and the lowest income which could expend this at Rs.300. In terms of clothing the average consumption is 16½ yards per annum, less than in Malaya, the West Indies, or the Gold Coast.[33 34] So far as social security is concerned India is limited at present to fragmentary and skeleton schemes for maternity benefit and workmen's compensation.

TABLE IV—FOOD CONSUMPTION: OPTIMUM AND ACTUAL

Diet	Calories	Protein		Calcium	Iron	Vitamin		
		Total	Animal			A	B_1	C
		g.	g.	g.	mg.	IU	IU	IU
Optimum * ..	3000	70	33	0·8	12	5000	594	1500
Orr's lowest 10%	2317	63	23	0 4	8	774	220	838
Typical poor Indian rice-eater†	1750	38	1	0·16	9	500	160	300

* National Research Council, USA.

† Surveys in the Punjab reveal somewhat higher figures but too much, perhaps, has been read into them. Malnutrition is rife in the North-West and famine not unknown even in very recent times. Infant mortality in the Punjab was 167 for 1936–40 and 214 in 1942; children under 15 years accounted for 60% of all deaths in 1940. Moreover, those areas with a high proportion of Sikhs do not reveal better figures.[43]

The standard of living, implicit in such facts as these, is translated, as tables IV and V show, into a cereal diet and inevitable malnutrition.[13 20 38] There is in consequence widespread underconsumption of animal protein, fats, calcium, vitamins A, C and the B_2 group.[20 55]

For the whole population estimates give the fluid milk-supply at less than 1½ oz. a day; vegetables at 3 oz.; eggs at 8 per year.[3] A balanced diet has been valued at about 2s. sterling a week, and is "far beyond the means of a large section of the population." [1] "By and large," the leading authority writes, "there is no doubt that a high percentage of the population does not get *enough* to eat . . . Enough food takes precedence over the right kind of food." It has been estimated [35] that India, before the war, could provide no home-grown food for 48 million persons if the balance of the population consumed an average of 2800 calories. Aykroyd's estimate [2] is that in " normal " times perhaps 30% of the population were quantitatively underfed. This is the setting in which the current " food shortage," the worst in 40 years, is operating.

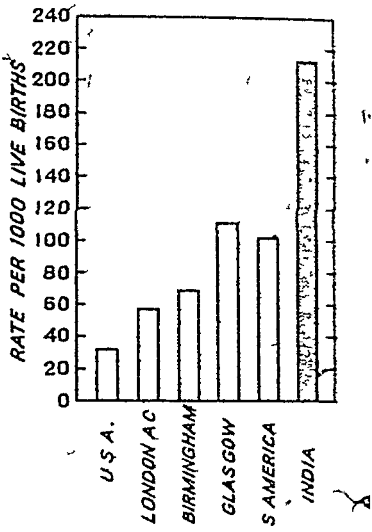

Fig. 2—Infant mortality in some great cities, 1941.[14 43] The rates for India, South America, and the United States are averages of the three cities with the largest populations.

LIVING SPACE

The following description of housing conditions in Bombay is taken from Khandwallah.[26]

> Pukka Chawls are one-room or, at most, two-room tenements. They are more like warehousing where wage-earners live as cheaply as possible. One-room tenements are mostly found in thickly populated sections of the city . . . The density is greater here. Every inch of available land is occupied by 2 or 3 storied buildings. They have narrow frontage and excessive depth. Most of the rooms lack light and air. Construction of the chawls is bad. They are built back to back and rooms are constructed in the same way . . . The floor is damp even in hot season. There is a window to a room but mostly remain closed to keep out the filthy smell from the gutters, privies, stables and streets. This naturally prevents smoke to go out as no smoke chimneys are provided . . . very often drains overflow or are choked and foul the lanes. All sorts of refuse is thrown by the tenants on the lanes and by-lanes which become stagnant. Dirty water from gutters overflow into the rooms at times when the plinth is too low and makes it impossible for the inmates to sleep on the floors.
>
> The greatest evil, however, is the cramped nature of the floor space. Too many people are housed in much too little floor space and too many buildings are crowded together and there is no privacy whatever. The condition of these people is unimaginable for those who do not live there. And in such rooms the occupants cook, eat, sit and sleep and at times also deliver babies!! Generally these rooms are 6 feet by 9 feet. . . . Mostly more than one family live in every room. (c) Ground floor rooms are darker and more unhealthy and stinking than the upper floor ones. Most of the rooms have not got a bathing place.
>
> Rents are high compared to the place, accommodation, and their wages. They are generally Rs.3 to 5 per month (about 4s. 6d.–7s. 6d. sterling) . . .
>
> Overcrowding is so acute in the city that streets and pavements are used for sleeping at night. This is a kind of safety-valve against housing inadequacies. As we have already examined, three-quarters of the City's population live in one-

TABLE V—THE PHYSIQUE OF SCHOOL-CHILDREN AGED ABOUT 13 YEARS *

	BOYS		GIRLS	
	Height	Weight	Height	Weight
	(in.)	(lb.)	(in.)	(lb.)
Madras 1939–43 .. .. (Corporation schools)	54	58	55	61
British Association, c. 1880 (children of artisans, towns)	56	79	56	85
Glasgow, c. 1906 .. .. (poorest schools)	54	72	54	72
Glasgow 1936 .. .. (averages)	57	83	58	88
Jarrow 1910–14 .. .. (averages)	54	66	55	71
Jarrow 1937 .. .. (averages)	55	76	56	77

* Compiled from various sources.[3 21 32] The rate of growth of children in subtropical zones cannot be discussed in this paper. At 5 years of age the differences in height and weight are of the same order as at 13 years. Few school-feeding experiments seem to have been carried out in India. In Madras, an experiment of very limited scope and duration yielded satisfactory results.[23]

(b) A rupee is 1s. 6d. sterling, an anna just over a penny.

(c) 10, 15 and 20 persons commonly "lived" in a single-roomed tenement.

room tenements. The floor space available for each is not more than the space occupied by a mat or 30–40 sq. in. per person. So at present, i.e. according to the census of 1931, 800,000 persons sleep on pavements . . .

Table VI depicts another aspect of this situation:

no better; the corresponding figures being 34,000 of 40,000 births and about 7500 of 8500 infant deaths.

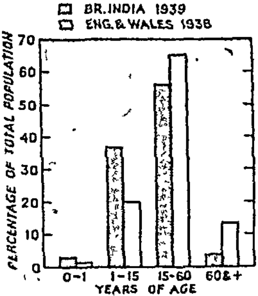

Fig. 3—The Indian population pattern.[44, 45]

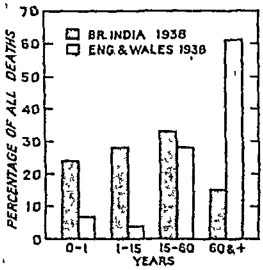

Fig. 5—The pattern of mortality. Distribution of deaths by epochs[44, 46]

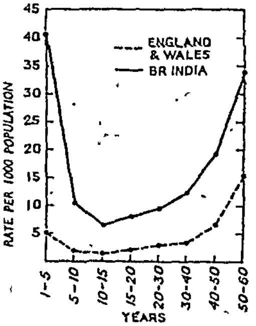

Fig. 6—Death-rate of males by ages, 1938[44, 46]

In Bombay province (1938) the living space in indus- son in Bombay City, 13 in nd 24 in Sholapur.[39] In 10st detailed information, 1943 lived in less than 60 sq. ft. per person, while in Bangalore City, with a popula- .5%, and in Kolar [27]

it is necessary to record that the number of inhabitants in 1943 was 124 per acre. This may be compared with London Admini- (13).[44] sity in George erfield

ematic research into problems of housing materials and construction methods is in its infancy.[34] There is neither town planning institute nor housing centre, nor any sign of their establishment.

THE INDIAN VILLAGE

The impression must not be gained from what has been said that India is an industrial community. This sub-continent is over-

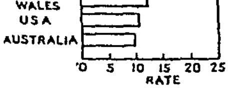

Fig. 4—Crude death-rates per 1000 population, 1939.[10, 15, 45]

of Hygiene and Public Health, paints the following picture of rural life[31]:

> Let us therefore inquire what is wrong with our villages. The approaches are indescribably bad, the environs are filthy, the houses are badly planned and wrongly constructed with poor material. The interior of the house, in many parts of the country, may not be quite as bad as the outside appearance would suggest, but the accommodation is insufficient, air and light do not find an inlet; the walls and ceilings provide rough surface for the spiders to spin cobwebs and for the various kinds of pests to harbour. The floors may be unswept and occupied by junk which has no right to encroach on the limited space. The old charpoi or the torn mattress may be the sole furniture. The cooking may be done in the corner of the living room, and the anteroom may be shared by man, cattle, and goats. The half empty grain-store and the wretched wearing apparels hung on the wall may tell their own story of misery. The stern vexatious look of the husband, the sullen face of the wife, the filthy, baked, potbellied children with sore eyes and visible evidence of chronic cold may breathe despair. The village tank may be full of aquatic growth and mosquito larvæ may breed in plenty. The well may be half broken, the water may be too dirty to drink. We may find ourselves surrounded by beggars. The faces of the people around us may betray the handwork of smallpox, malaria, leprosy, venereal diseases, and various other nondescript skin and other affections. We may meet some clever villagers here and there, but the general level of intelligence may be very low and many of the people may be half demented and illiterate . . .

For some factual evidence of this environment recourse may once again be made to Mysore[38] where a village health survey in one of the units subsidised by the Rockefeller Foundation disclosed this situation[47]:

TABLE VI—HOMES AND INFANT LIFE IN BOMBAY 1940

"The huge city which the West has built and abandoned with a gesture of despair."

Nature of tenement	Births		Infant deaths		IM per 1000 registered births
	No.	%	No.	%	
"Roadside"	68	0·1	28	0·4	482·8
1 room & under	25,196	66·6	5487	70·1	217·8
2 rooms ..	6766	17·9	1549	19·8	228·9
3 rooms ..	2111	5·6	317	4·0	150·2
4 or more rooms	1197	3·2	207	2·6	172·9
No information	2505	6·6	244	3·1	97·4
Total ..	37,833	100·0	7832	100·0	207·0

> Twenty-five per cent. of the families in this unit had an income under Rs.5 per month, 30% had a monthly income of Rs.5–10, 25% between 10 to 15 rupees, 10% between Rs.15 to 20, and the rest above Rs.20 per month. 30% of the families had only one room, the rest more than one room. 1·5% of the houses were provided with latrines, the rest had no latrines. 70% of the houses had no windows and 25% of the houses were unfit for habitation. 50% of the houses were without drains and in 50% of the houses the cattle were kept in living quarters. In 40% of the houses the kitchen refuse was stored in the backyard and in 15% it was thrown into the streets. In 40% of the houses the sullage water was led into the backyard and in 50% it was led into the street. There was very little provision for safe drinking water. In 30% of the houses the manure was stored in the backyard and in the rest it was sent out to the fields . . .[52]

PREVENTIVE MEDICINE

The tropical countries have made immense advances in the organisation of preventive medicine. India has

---

(d) The implications of this table cannot be further pursued because information is lacking on the constitution of the households and the mode of ascription to "tenements."

contributed her full share in brilliant researches but her peoples, as yet, have benefited less than others in the East (e). At the turn of the century, according to Grant, the decennial death-rates in Asiatic countries from smallpox and cholera were "practically the same." In the interim something has happened (table VII) despite expenditure on hygiene in India proportionately little less than in the Philippines or the Netherland East Indies.

TABLE VII—MORTALITY FROM PREVENTABLE INFECTIONS, PER 100,000 POPULATION

Infection	British India	Burma	Japan	Philippines	NE Indies	Thailand
Smallpox						
1936 ..	30·6	9·2	0·04	0·0	0·0	0·0
1937	16·2	9·3	0·008	0·0	0·0	0·08
Cholera						
1936 ..	47·1	6·7	0·0	0·01	—*	21·6
1937 ..	29·3	23·7	0·01	0·01	—*	41·1

* Not available; 0·0 in 1930, 1932, 1934.

Of the 1471 towns in British India only 253 have protected water-supplies.[39] In Calcutta the annual epidemic of cholera is "traditional."[43] The death-rate from cholera in all India of over 100 per 100,000 in the wake of the 1943 famine has already been noticed. Deaths from diarrhœa and dysentery in 1941 were 491 per 100,000 in Madras City, little less in the other 15 Municipalities of the presidency, and 110 per 100,000 over all India. Typhoid mortality in the three great cities during 1940 ranged from 16 to 90 in 100,000 which takes us back once again to Victorian England. Rural water-supplies and sanitation are of course less protected than urban, and there is only too often a general and unholy confusion of drinking and cooking with laundry and sullage, human and animal excreta. There is, moreover, little tradition of observance of the scanty sanitary legislation that has been enacted. Calcutta's public health services move from one crisis to another. The 1944 turmoil over the medieval inadequacy of its refuse disposal system was no sooner subdued than epidemic smallpox broke out. Government expenditure on hygiene in 1939–41[10] was about 1*d.* per capita in Madras, Bengal, and the Punjab, and about 2*d.* in Bombay, though the towns expend much more substantial sums.

CARE OF THE SICK

Medical services depend on trained personnel; on their number and quality. India has 42,000 doctors—or 1 to approximately 10,000 people. Of these, a third have university qualifications, two-thirds are "licentiates" with licences granted after shorter training.[16] There are perhaps 5000 trained nurses in India, the great majority of whom, as might be expected, are employed in the towns. It was estimated in 1935 that less than 300 worked among the 300 million villagers. The Director-General of the Indian Medical Service has recently summarised the position[22] in regard to trained personnel (*f*).

Health workers	*Actual*	*Necessary*
Doctors	40,000 ..	300,000
Nurses	7000 ..	778,000
Health visitors	1000 ..	70,000
Trained midwives ..	5000 ..	90,000
Pharmacists	75 ..	100,000
Dentists	1000 ..	120,000

What has also to be remembered, in considering the problem of care of the sick, is that domiciliary treatment is hardly practicable on account of existing housing conditions. As regards hospitals there are 0·3 beds per 1000 population.[9] In England, the pre-war ratio was 5 (excluding mental institutions); in Japan 1·5, and in the USA 9·7. Government expenditure on "medical relief," on hospitals and dispensaries, is normally a few pence a head. In 1941 it was about 4½*d.* in Bombay and the North West Frontier Province, 3½*d.* in Madras, 3*d.* in the Punjab, and less than 2*d.* in Bengal.

"There are altogether 6500 curative dispensaries and hospitals in India," writes Grant, "which can treat annually only a total of 35 million new and old patients. The bulk of medical relief for India's 400 millions, of whom more than 80 per cent. live in villages, is still provided through the indigenous prescriptive systems of medicine and their practitioners.[17] (*g*)

Malaria, endemic and epidemic, continues to be the most intractable health problem of India, with infections estimated at 100 million attacks a year[48] and deaths at well over a million. The prevention of this preventable disease is too complicated to take up in this paper. (The Premier of Assam has recently stated that he cannot interfere with destiny.) (*h*) Pre-war native production of cinchona alkaloid was 50,000 lb. (early in 1945 increased to 90,000 lb.) against a consumption of 200,000, and requirements of 1–1½ million lb.[23] [48] Nine-tenths of world supplies came from the Indies, but this sorry story has been told often enough in the West. The sequel, however, is not so generally known. India has no fine chemical industry and manufactures no mepacrine. In 1942, with requirements in the region of a quarter million lb. such little mepacrine as did arrive retailed at the fancy price of 3*s.* per treatment. Proposals to produce the drug locally, to sell at approximately 5*d.* per course, were prevented by the impossibility of importing certain basic chemicals that could not at that time be manufactured in the country (*i*).

The position, as it concerns the sulpha drugs, is not dissimilar. Sokhey[48] points out that these two compounds "could take care of more than three-fourths of all major illness in India" (meaning, presumably, illness amenable to specific therapy; he was writing in the days when hopes of curing plague were high). But the small supply of sulphathiazole that was imported sold at Rs.200 per lb (say £15), the equivalent of about 10*s.* 6*d.* for each case of plague treated—which is out of touch with reality. Local estimates, again based upon the arrival of certain basic materials, put the price of manufacture at about 30*s.* per lb, or 1*s.* per treatment. Sulphapyridine is now (late 1944) selling at 3*d.* a tablet.

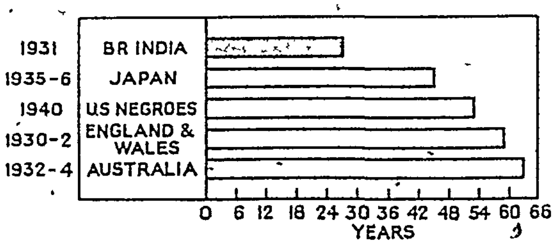

Fig. 7—Expectation of life at birth (males).[13] [14] [17] [48]

Total expenditure on health in India, on prevention and treatment, is probably much less than in Scotland. The Central and Provincial governments in 1937–38 spent about 11*d.* a head on justice, police, and jails, 8*d.* on general administration, 4*d.* on health services, and 1*d.* on agriculture (fig. 8). Nor was the position better in Bengal[47] in 1939–40 where public security cost 1*s.* 1*d.* and health less than 3*d.* Expenditure on social services is growing, but Bengal, which increased its revenue by 18% between 1936–37 and 1939–40, found herself able to spend only 12% more on health.[10] [16] Over all the provinces expenditure on health services per capita fell from about 3*d.* to just under 3*d.* between 1931–32 and 1939–40. The richest State in India[51] spends roughly

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(*e*) The highly successful anti-rabies service is an exception.

(*f*) Discrepancies in the figures will be noted but these cannot be avoided in what is often, at best, no more than intelligent conjecture by the authorities quoted.

(*g*) This is not the whole story. One of the most progressive States in India is now spending half a million rupees on an Ayurvedic hospital in its principal city which possesses neither an infant welfare centre nor a VD clinic.

(*h*) An illuminating example occurred recently of the operation of the time factor in Indian progress. In January, 1944, it was reported that the Public Health Commissioner with the Government of India visited Calcutta to investigate the outbreak of malaria in epidemic form in the city. In this connexion he visited the Salt Lake area "the reclamation of which has been strongly recommended . . . for combating the scourge."[21] In the MOH's account of this problem, 3 years before, it was stated that "various projects of reclaiming the Salt Lakes were considered by the Government *even prior to 1804* . . . on account of the neighbourhood being very unhealthy with a large mortality."

(*i*) The position has since improved. Mepacrine is now (late 1944) available at 9*d.* a full course and quinine at 1*s.* 2*d.*

2½*d.* a head on public health and 7*d.* on the royal households. (*j*)

TUBERCULOSIS

There are in India upwards of half a million deaths annually from tuberculosis—mostly pulmonary.[24] This is the newest of the graver health problems (table VIII) and while the infection is not usually associated in Western minds with agrarian, undeveloped countries, it has to be remembered that India has an *urban* population (though not of course *industrial*) greater than the total population of the United Kingdom.

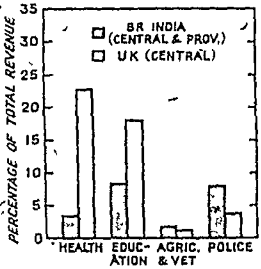

Fig 8—State expenditure on social services 1938–39.[44]

When the Calcutta rates for 1941–42 are broken down it is seen that mortality is concentrated in certain age-sex brackets (table IX). In an investigation of maternal mortality in Calcutta, tuberculosis was found to be responsible for 41% of the deaths due to intercurrent disease.[37]

How many *cases* there are is pure speculation. Various estimates range from 3–9 million.[24 31] Calcutta is said to contain 100,000. Of Madras, the superintendent of the Government Institute was reported recently as follows:

> Ov [illegible]
> an [illegible]

TABLE VIII—DEATH-RATES FROM TUBERCULOSIS (ALL FORMS) PER 100,000 POPULATION

	Rate		Rate
London (1938)	73	Calcutta (1938–42) ..	240
Glasgow (1939)	108	Bombay (1938–42) ..	140
Buenos Aires (1939–41) ..	109	Madras (1938–42) ..	121
New York "Coloured" (1942)	194	Madras Presidency (15 municipalities, 1941)	236*
		Cawnpore (1942–43) ..	200†
		Lahore (1940)	162
		Karachi (1939–41) ..	200†
		Delhi (1940)	200

* Pulmonary. † Approx.

> nosed by the general hospitals and private practitioners. If these were taken into account it might be that there were as many as 10,000 open cases in the city. The incidence was greatest between the ages of 20 and 30 and among the poor and labouring classes living in congested surroundings . . .

TABLE IX—TUBERCULOSIS MORTALITY IN CALCUTTA PER 100,000 POPULATION

Age (yr.)	*Males*	*Females*
10–15	60	40
15–20	80	200
20–30	180	500
30–40	130	320
60 plus	170	230

> He supported the Mayor's idea of starting a hospital with at least 100 beds . . .

Benjamin[46] has reported three interesting surveys in South India (table X). Surveys II and III were followed up and it was subsequently estimated that between 1% and 3% were suffering from active tuberculosis. In the suburb, mortality appeared to be around 100 per 100,000.

TABLE X—INCIDENCE OF TUBERCULOUS INFECTION

	Adults	Children	Technique
	%	%	
I. A rural district .	38	11	Von Pirquet
II. A Madras suburb	70	41	Mantoux
III. An up country town	65	31	,,

In social medicine it is axiomatic that tuberculosis and high standards of living are inversely related; the [illegible] ult it is to [illegible] to control [illegible] Association of India[46] for 1942 provides an illustration (table XI):

TABLE XI—CARE OF THE TUBERCULOUS IN INDIA

Clinics	112
Hospitals and sanatoria	66
Beds in special institutions	4000
Beds in general hospitals	1207
Beds in jail	737

There are around 6000 beds in India which work out at (very approximately) 1 per 100 deaths. This may be compared with England and Wales (over 1 bed per death) and Scandinavia (almost 2). Scotland, with one-tenth the population of Madras and probably a lighter load of infection, has four times as many beds for tuberculous cases. In this setting there appears to be no answer to Frimodt Moller,[15] pioneer of modern tuberculosis work in India:—

> "What is the use, for example, of introducing compulsory notification of all TB cases with compulsory modern treatment when the existing facilities for such treatment are completely negligible?" (*k*)

The present policy may be summarised as "organised home care"—"organised" to meet in some way the needs of, for example, 90% of the fresh cases discovered by the New Delhi clinic in 1942, who needed institutional treatment which was unlikely to be available.[8 46] Any acquaintance with Indian housing conditions suggests that this policy is impossible of application in the vast majority of cases. The available evidence suggests, moreover, that India is in the waxing phase of the process of tuberculinisation.

RECONSTRUCTION

These brief notes have examined the Indian situation in terms most familiar to English readers. They have dealt with only a few aspects of the vast problem of disease and malnutrition. To extend this recital to include leprosy, blindness,[18] hookworm, and the care of [illegible]

demands.

It is clear that there can be little hope of health for these 400 million people except as part of an epochal social transformation, economic and cultural (*l*). It emerges, however, that more energetic steps to insulate the "vulnerable" groups of mothers and children from the more glaring deficiencies of their environment are radically needed, though to fulfil their purpose they would require the resources of the great cities of the west. Meanwhile, it is surely out of focus to suggest that India should be a donor to UNRRA instead of an early beneficiary.

It is welcome that there has now arisen discussion of plans for the future of India if only because there are many [illegible] (As yet [illegible] trial en[illegible] reason t[illegible] a menace to the people's health, will increase; nor can the enrichment of the countryside be taken for granted. Economic advance does not automatically pay dividends in welfare, as English experience has made abundantly clear. It is to be hoped that the report of the Bhore Committee will prove the catalyst in Indian life that Chadwick's writings were a century ago in England. The important news is that India has begun to plan. Some blue-prints already exist and those drawn up by a

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(*j*) It should be noted that health services are almost entirely a provincial or municipal responsibility. In 1941 central governmental expenditure on health amounted to less than 2*d.* per head of population.

(*k*) T[illegible] from [illegible] with [illegible] s. By [illegible] more [illegible] rently [illegible] o jail inmates works out at more than 1 for 200. During 1943 there was a small increase in the number of beds available for the general population.

(*l*) 24% of men and 2% of women were literate according to the recent census.

group of Bombay industrialists[39] have attracted attention. Their prodigious programme to double the national income in 15 years (by which time the population may be well up to 500,000,000) "has the modest aim of securing a general standard of living which leaves a reasonable margin over the minimum requirements of human life." Naturally, the plan has much to say on health, but the proposals it makes are too vague to form a basis for discussion. Thus, in the scheme for rural reconstruction, it is orthodoxly proposed that each village should have a dispensary staffed by a qualified doctor and two nurses, one of whom at least should be a trained midwife. On the unlikely assumption that many such trios of health workers could cover 3 villages instead of one, the rural programme *alone* would absorb perhaps 250,000 doctors, 250,000 nurses, and 250,000 midwives. This would require a tenfold expansion of medical schools and possibly a hundredfold increase in the training of nurses (*m*).

But consideration of remedies in detail must be postponed until reports of the Health Survey and Development Committee and the Famine Inquiry Commission are available. What matters is that India has made a start, and that from the beginning its scientists are contributing their share. This new mood, too, coincides with a quickening of the public conscience on social welfare—among the most effective "new momenta" in Victorian England. This subcontinent of India, with its millions of underprivileged humanity, now awaits the exploitation of social medicine on as bold a scale as human ingenuity and imagination can devise.

I wish to thank Prof. J. A. Ryle, Dr. J. B. Grant and Prof. R. B. Lal for reading the MSS; friends for various criticisms, and Mr. Richard M. Titmuss for much help.

(*m*) The present output of doctors in India is 1700 per year, 700 with university degrees and 1000 licentiates. Granting the upgrading of the non-university schools (in itself an enormous undertaking) and making little allowance for wastage by retirement and death and the claims of the Army, an increment of 25,000 qualified doctors for civilian service in 15 years might be anticipated. The increment in the United Kingdom is 1000 a year. In the USSR between 1928 and 1941 the total number of doctors increased by 67,000.

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SYSTEMIC ADMINISTRATION OF PENICILLIN

BY ABSORPTION FROM BODY CAVITIES

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THE following investigations were carried out to ascertain whether a suitable dose of penicillin injected into serous or abscess cavities would not only act locally but would produce a prolonged and effective level of the drug in the blood-stream.

The route in most cases investigated has been the pleural cavity but penicillin has also been given via the knee-joint, intrathecal space, and abscess cavities. A single injection following aspiration, at the rate of 120,000 units per 24 hours, has been given to adults. For children up to 8 years, 1000 units per lb. of body-weight per 24 hours was used—an amount which, given in divided doses by the intramuscular route, has been generally found adequate to maintain bacteriostasis.

The presence of a bacteriostatic concentration in the blood-stream (or "serum inhibition") was tested for by the drop-on-slide method (Garrod and Heatley 1944). At varying times after administration, blood was collected from the dried lobe of the ear, under strictly aseptic precautions, into capillary tubes. The latter were sealed at both ends in a flame—care being taken not to heat the blood—and centrifuged after clotting had taken place. A drop of serum was withdrawn with a micropipette, placed on a microscope slide, inoculated with $\frac{1}{20}$th to $\frac{1}{10}$th of its volume of a $\frac{1}{1000}$ suspension of a 16–24 hour broth culture of the Oxford strain of *Staphylococcus aureus* (NCTC, no. 6571), covered with a coverslip, and sealed with paraffin wax and soft paraffin. A control of the patient's serum when not under the influence of penicillin was set up in the same way alongside the sera to be tested. The slide was incubated at 37° C and examined after 12, 24, and 48 hours' incubation.

Complete bacteriostasis was taken to be represented by absence of visible growth in the drops throughout the 48 hours. Partial bacteriostasis was recorded when colonies of staphylococci appeared in considerably fewer numbers than half those found in the control at any period of incubation. Occasionally some minute colonies appeared after 12 hours but disappeared after 24–48 hours' incubation; these results were also read as partial inhibition.

PLEURAL ROUTE

All the pleural cavities injected gave evidence of bacterial infection with the exception of one hæmothorax, and one where there was a sterile pleural effusion, pre-

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* With a grant from the Medical Research Council.

sumably tuberculous in origin. Table I sets out the serum inhibition found in 16 cases at 24 hours and later, after a single standard 24-hour dose. The inhibition was also investigated at varying intervals from half an hour after injection onwards, and, though it was not possible to take tests regularly on every case, sufficient were done to show that bacteriostasis was usually present throughout the experimental period. Sometimes it disappeared temporarily while the patient was sleeping, possibly because he was not expanding his lungs well. In most of these cases the results were confirmed after several separate injections of the same dose. In two cases, where bronchopleural fistulæ were present, readings did not agree (see table I). In case 1 corroborative evidence that penicillin was circulating in the blood was sought by testing the urine: each of six samples collected at regular intervals throughout the 24-hour period gave, with the cylinder-plate method (Heatley 1944), large zones of inhibition.

Pleural exudates collected at the next aspiration were also tested by this method. It was subsequently found that a small ring of inhibition might be produced by pleural exudate independently of the presence of penicillin, so those readings have been assumed to indicate its presence only when the ring produced was more than 20 mm. in diameter or when the exudate was diluted 10 or more times.

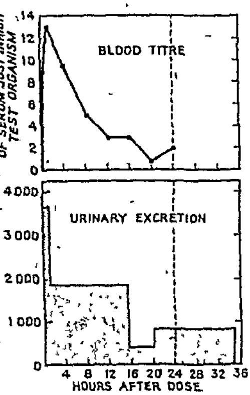

Fig. 1—Penicillin in blood and urine after intrapleural injection of 120,000 units

Case A.—Left-sided empyema.
Volume of effusion ... .. 224 c cm.
Total penicillin injected (in 20 c.cm.) ... . 120,000 units
Total excreted in urine in 24 hours .. .. 37,000 units
Residual penicillin (approx.) in pleural exudate at end of 24 hours ... . 37,000 units (167 units/c.cm.)
Urine could be collected from this patient only at long intervals.)

With the dose prescribed, penicillin passed out of the pleural space into the blood-stream fairly steadily for 24 hours at a rate that maintained a bacteriostatic level in the blood. *This occurred irrespective of the estimated size of the cavity or the presence of sterile, acutely inflamed, or granulating walls, or even—on some occasions—of a bronchopleural fistula.* The blood-level after 24 hours was too inconstant for a systemic effect to be relied on, though an ample concentration to act on the walls of the cavity was often found after several more days.

It was hoped that doubling the dose might also double the time during which the drug would act systemically. *Table* II records the results obtained when this was tested.

of

the

group, serum inhibition, though not constantly found at 48 hours, lasted near enough to this period for practical clinical purposes. An exception occurred in a case of inoperable new growth, where thoracotomy only was performed and the chest was closed with the entire lung left in situ (case 3, table II). In such a case little cavity could have remained after the thorax was closed. The urine was again tested in one case (case 1, table II), and undiluted produced a large ring of inhibition 72 hours after the injection.

Two cases, one with an inflammatory exudate and another with a transudate, were injected with 300,000 units in an effort to prolong the length of systemic treatment to 3 days, but neither gave evidence of bacteriostasis in the blood-stream at the end of this period, although in one case the urine, in a dilution of 1 : 100, produced a large ring of inhibition at this time.

At the end of these trials, a more detailed study of the penicillin content in pleural exudate, serum, and urine was possible (figs. 1 and 2). Two separate empyemata in adults, one left- and one right-sided, were treated with 120,000 and 240,000 units. The inhibitory power of the serum was measured by the drop-on-slide method used semiquantitatively. Twofold dilution series of the sera were made, but an approximate interpolation has been attempted, the points on the graph being the *estimated* dilution at which the "Oxford" strain of *Staph. aureus* would just be completely inhibited.

Urine was assayed by the cylinder-plate method, each assay value being derived from four

been plotted against time, the area under the curve therefore giving the amount excreted. The pleural exudate was assayed in the same way both after simple dilution and after extraction through amyl acetate into buffer (Garrod and H

total amount of penici

concentration in blood

for the following reasons:

(*a*) Different samples from the same aspiration might possess different concentrations of penicillin.

(*b*) The size of the cavity was impossible to gauge accurately—e.g., a cavity from which 1000 c.cm. was aspirated at first contained only 90 c.cm. at the next aspiration.

(*c*) It was not always possible to be sure that aspiration had completely emptied the cavity, though this was counteracted somewhat by measuring the amount removed subsequently when the cavity was drained.

Only an approximate estimate, therefore, of the total amount of penicillin remaining in the cavity at the end of the experimental period could be made. Figs. 1 and 2 set out the results obtained in these two cases.

In the first case, an inhibitory concentration was found

ughout the 24-hour period, and

rable amount remaining in the

cond case inhibition only lasted

, but since it was again found at 14 hours, enough penicillin must have been present in the pleural cavity during this period to pass into the blood-stream in a detectable concentration under suitable conditions. The 10 hour sample was taken at 2 AM, when the patient was sleeping, and this may account for the absence of inhibition in the blood, since at 14 hours, when almost complete bacteriostasis had returned, he was awake and more active. The temporary decrease in blood titre is reflected in a corresponding decrease in urinary excretion: *the same* effect is shown in case A.

The following comments may be made on the results in these two cases:

(1) A concentration of 167 units per c.cm. in the pleural cavity was sufficient (in the first case) to produce detectable serum inhibition, whereas a concentration of 45 units per c.cm. (in the second) did not do so.

(2) The rate of excretion in the urine at the time when serum inhibition had

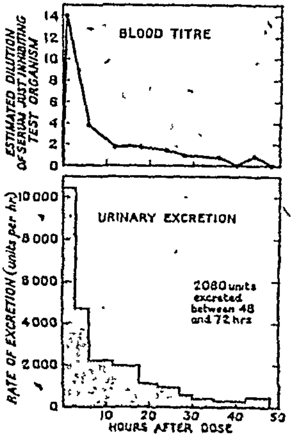

Fig 2—Penicillin in blood and urine after intrapleural injection of 240 000 units.

Case B —Right-sided empyema.
Volume of effusion ... . 180 c.cm.
Total penicillin injected (in 20 c.cm.) .. ... . 240,000 units
Total excreted in urine in 48 hours .. . . 79,000 units
Residual penicillin (approx.) in pleural exudate at end of 48 hours . .. . 8100 units (45 units c.cm.)

nearly disappeared was of the same order in both cases—300 to 600 units per hour.

OTHER CAVITIES

Less extensive trials have been carried out on the knee-joint and intrathecal space and on abscess cavities (table IV).

Intrasynovial injection into an intact knee-joint (case 1) resulted in inhibition for little more than 13 hours after the first dose, but after the second, when presumably there was already some residual penicillin in the joint space, inhibition continued considerably longer.

The somewhat inconsistent results obtained in the hæmarthroses may be due to associated trauma allowing leakage out of the synovial cavity via fractured bone or soft tissue, since these patients were all battle casualties. In case 4 a considerable amount of penicillin was still being excreted in the urine between 24 and 27 hours after the injection of 120,000 units, though detectable bacteriostasis in the blood-stream had disappeared after 7 hours.

Intrathecal injection was tried in 3 cases—2 with inflammatory conditions of the meninges and one where circulation of the fluid must have been impaired. The duration of serum inhibition however agreed fairly closely.

An attempt was made to judge whether the slow absorption found in all these cases was a specific property of synovial membranes or would apply to any space within the body. The following two tests bear on this point.

An injection was made between the pleuræ in one case with pneumonia where no cavity was found (case 10, table IV). The absence of cough or stained sputum and the ease of injection appeared to indicate that the injection was made into the pleural space. The short period of serum inhibition is in striking contrast to its length in those cases where injections were made into a definite cavity.

A second test was carried out on a breast abscess (case 9, table IV). This cavity was considerably smaller—25 c.cm.—than the empyemata and yet serum inhibition appeared in the blood for much longer than would be expected from analogy with intramuscular injections.

TABLE I—INHIBITION AFTER INTRAPLEURAL INJECTION OF PENICILLIN

100,000–120,000 units, or its equivalent in children, in 16 cases

Case no.	Type of case	Age in yr.	Size of effusion (c.cm.)	Dose in 1000 units	Inhibition (hours after dose)					
					In serum			In pleural ex.		
					24	30–36	40–48	24	48	96
1	Post-pneumonectomy effusion (inf.)	50	160	105	+	..	..	..	+	+*
2	Post-thoracotomy transudate (st.)	>30	?	120	±	±	..	..	0	..
3	Hæmothorax	26	390	116	+	..	..	..	..	..
4	„ (inf.)‡	8	700	75	+†	+	±	..	+	..
5	Effusion (st.)	22	1000	120	±	±	0	..	+	+
6	„ (inf.)	53	500	105	±	..	..	+	..	+
7	„ „	46	400	120	+	+	0	..	+	..
8	Empyema	47	390	120	+	0	0	..	+	..
9	„	74	140	120	+	..	..	..	..	..
10	„	40	56	120	±	0	0	..	+	..
11	„‡	6	30	120	±	0	0	..	+	..
12	„	8	56	60	±	..	..	..	..	..
13	„	4	196	45	±	0	..	..	+	..
14	„‡	3½	140	45	±†	..	..	+	..	..
15	„	1$\frac{1}{12}$	56	21	+	..	..	..	..	..
16	„	$\frac{11}{12}$	45	10	+	..	..	..	..	..

0 = no inhibition.
In serum { + = Inhibition in undiluted serum.
{ ± = Partial inhibition in undiluted serum.
In pleural exudate + = Ring not less than 20 mm. in diameter, undiluted; or ring present in dilutions of 1 in 10 to 1 in 10,000.
Inf. = infected, st. = sterile.
* Also + at 9 days. † No inhibition on another occasion.
‡ onchopleural fistula.

DISCUSSION

A considerable body of evidence has already accumulated on the persistence of penicillin in thecal and pleural spaces, and in abscess cavities for periods of 24–48 hours and even longer (Rammelkamp and Keefer 1943, Garrod 1944, D'Abreu, Litchfield, and Scott Thomson 1944, Cairns, Duthie, Lewin, and Honor Smith 1944, Tillet, Cambier, and McCormack 1944, Roberts, Tubbs, and Bates 1945, &c.). Passage from blood-stream into cerebrospinal, pleural, and peritoneal fluids has also been investigated and its lower concentration in these noted (Florey and Florey 1943, Rammelkamp and Keefer 1943, Fleming 1943, Rosenberg and Sylvester 1944, Cooke and Goldring 1944), with the result that treatment by a combination of local with intramuscular or intravenous injections has been adopted whenever both local and systemic treatment were indicated.

TABLE II—INHIBITION AFTER INTRAPLEURAL INJECTION OF PENICILLIN

200,000–240,000 units in 8 cases

Case no.	Type of case	Age in yr.	Size of effusion (c.cm.)	Dose in 1000 units	Inhibition (hours after dose)						
					In serum					In pleural ex.	
					24	30	42	48	56	48	96
1	Post-pneumonectomy transudate (st.)	55	½ thorax	240	+	..	±	0	0	+	±
2	Post-lobectomy transudate (st.)	21	?	225	..	+	..	..	0	+	±
3	Post-thoracotomy transudate	63	?	240	+	0	..	..	.	0	..
4	Effusion (inf.)	37	500	210	..	..	..	+	0	+	+¶
5	„ „	64	390	240	+	..	..	+	+	+	..
6	Empyema „	52	556	240	..	..	±¶	±	0	+	0
7	„ „	64	180	240	+	+	..	+	..	+	..
8	„ „	57	200	200	+	+	+	0	..	+	..

Abbreviations as in table I. ¶ Also + at 7 days.

The purpose of the investigations described in this paper has been to study the reverse process—passage from local space into the blood-stream—in the hope that both local and systemic treatment might be combined in one method of administration. Rammelkamp and Keefer (1943) noted a detectable concentration in the blood for a few hours after single intrathecal, intr pleural, and intrasynovial injections of 10.000 unit It appeared reasonable to assume that the slow absor tion from these cavities could be made use of to mainta a bacteriostatic level in the blood-stream for a long perio provided that a large enough initial dose was injected.

TABLE III—INHIBITION AFTER INTRAPLEURAL INJECTION OF PENICILLIN

300,000 units in 2 cases

Case no.	Type of case	Age in yr.	Size effusion (c.cm.)	Dose in 1000 units	Inhibition (hours after dose)				
					In serum			In pleural ex	
					24	48	72	72	Later
1	Post-pneumonectomy effusion (inf.)	54	60	300	..	..	0	+*	+† at 5 da
2	Empyema	21	500	300	+	+	0	+*	+† at 4 da

* Ring present in dilutions up to 1 in 1000.
† Ring present in dilutions up to 1 in 500. inf. = infected.

The amounts actually used satisfied the requiremen in the case of the pleural cavity. Though it is realise that physical factors, such as surface area and shape c cavity, thickness and congestion of walls, viscosity c

TABLE IV—SERUM INHIBITION AFTER INJECTION OF PENICILLIN INTO VARIOUS CAVITIES

Case no.	Route of injection	Type of case	Dose in 1000 units	Inhibition	
				Present at (hours)	Absent at (hours)
1	Knee-joint	Non-purulent streptococcal arthritis	120 (1st) (2nd)	13 20	16 24
2	,, ,,	Purulent streptococcal arthritis	120	24*	..
3	,, ,,	Hæmarthrosis	100 (1st)	18	..
4	,, ,,	,,	100 ,,	12	20
5	,, ,,	,,	100 ,,	7	8
6	Intrathecal space	Pneumococcal meningitis (infant)	15 (1st)	15	21
7	,,	Tuberculous meningitis	120	12	20
8	,,	Cerebral tumour	120 (1st)	16	20
9	Abscess cavity	Breast abscess	120	12	24
10	Between pleuræ	Pneumonia	120	4	6

* Partial inhibition only.

... the greater convenience of administration and the lessened discomfort to the patient.

So far as other cavities are concerned only an indication h ... stemic treatment

The ... has already

... and once every 24 hours in the latter—has been effective in (*a*) the prophylaxis of postpneumonectomy infection, and (*b*) the treatment of pneumonia, pyæmia, osteomyelitis, and streptococcal arthritis when accompanied by pleural or synovial effusion.

In the cases receiving intrathecal injections the semi-comatose condition of the patients prevented any minor untoward effects from being noticed. There were however no fits, no loss of reflexes, and no gross changes in the temperature and pulse curves which could be directly attributed to the injection of these concentrated solutions. At present, when brands of penicillin vary considerably in purity, this treatment cannot be recommended until there is sufficient evidence to decide whether or not such concentrated solutions will harm the central nervous system. If they do not, it might be practicable to carry out systemic treatment for meningitis by a dual method. Intrathecal aspiration and injection could be performed in the evening, obviating the disturbance from intramuscular injections during the night, leaving only 8–12 hours of the day for the blood-level to be maintained by intramuscular administration.

Successful systemic treatment via an abscess cavity was carried out in a case of streptococcal septicæmia with multiple foci of osteomyelitis. Three-hourly injections, made through a small tube leading into a cervical abscess, maintained a constant inhibitory level in the blood-stream, and the patient—a diabetic—recovered from her grave condition. Had the knowledge obtained from the breast abscess experiment been available at the time, doses could have been larger and more conveniently spaced at longer intervals.

SUMMARY

Injection of 120,000 units of penicillin into a pleural cavity, after aspiration of an effusion, ensured a bacteriostatic concentration of the drug in the blood-stream for 24 hours or more; 240,000 units produced a similar effect for about 48 hours.

Injection of 120,000 units into two intact but infected knee-joints produced the same effect for at least 13 hours in one case and 24 hours in the other.

Injection of 120,000 units in 2 adults, and its equivalent in an infant, into the intrathecal space produced the same effect for about 15 hours.

The protracted systemic effect due to slow absorption does not appear to be an exclusive property of serous membranes, but is also associated with cavities in the body not lined with such membranes, such as abscess cavities.

Clinical application of these findings has already given good results.

Ce ...

Miss M. E. Smith for providing facilities for carrying out a large part of the work and for their assistance with it. Mr. L. Fatti, Dr. Avery Jones, Dr. A. Cooke, Miss Honor Smith, and Prof. L. J. Witts also kindly allowed investigations to be carried out on their cases. Mr. L. H. Truelove assisted with the later part of the work. Dr. M. A. Jennings gave advice on the text.

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ON SULPHADIAZINE DYSURIA

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THE clinical picture and pathological findings in cases of kidney dysfunction from sulphapyridine and sulphathiazole poisoning are well recognised. A review of 8 such cases of sulphathiazole origin was recently given by Campbell.[1] During the treatment of some 150 penetrating head wounds with sulphadiazine, an opportunity arose to study the dysurias occurring with this drug.

DOSAGE

To maintain an adequate concentration of the drug in blood, and especially cerebrospinal fluid, during the period following brain wounds, when risk of brain and meningeal infection was high, the following routine course was used.

> After an initial 3 g. intravenously, 3 g. was given by mouth 4-hourly for 48 hours, then 6-hourly for a further 18 hours. In the first 40 cases so treated, sodium bicarbonate gr. 20 and sodium citrate gr. 20 were given with each dose of "diazine." No special attention was paid to fluid intake apart from maintaining an average daily intake of about 8 pints.

In this series there were 6 cases (15%) of poisoning. This comparatively high incidence caused us to review the alkali and fluid intake, and thereafter, in a further series of 410 cases, with each dose of diazine, sodium bicarbonate gr. 40, sodium citrate gr. 30 and 10 oz. fluid were given, and a minimum total fluid intake of 10 pints in 24 hours was aimed at. In this series a further 11 (2.5%) cases of dysuria occurred.

In 14 of the total series it was necessary to prolong the dosage of 3 g. per 6 hours for periods from 1 to 4 days after the usual full 4-day course. None of these patients developed dysuria.

In a further 18 cases of the total 150, the patients' degree of responsiveness was such as to preclude giving the drug by mouth or Ryle's tube.

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[1] Campbell, J. M. *Brit. J. Surg.* 1944, 31, 236.

In these the following routine was observed.

Glucose-saline intravenously at the rate of 1 bottle (540 c.cm.) per 4 hours was given. To alternate bottles 5 g. of Squibb's ready-sterilised powdered diazine was added. For every third bottle of saline 1 bottle of a sterile solution of 4% sodium bicarbonate and 4% sodium citrate was substituted.

None of these cases developed dysuria, or the urinary changes associated with it—a more informative finding in the unresponsive patient.

CLINICAL FINDINGS

The clinical and urinary picture of dysuria was early impressed on us. It conformed largely to what has already been described with other sulpha drugs. The onset was usually 48–72 hours after starting the course; however, 2 cases occurred 24 hours after its cessation and 1 about 36 hours after. The commonest first symptom was intense abdominal pain (often so severe as to demand immediate 'Omnopon' and scopolamine), sometimes simulating renal colic in type and distribution, sometimes referred to the hypogastrium suggesting an acute cystitis, and less commonly simulating a small-bowel colic. With this more or less loin tenderness, either bilateral or unilateral, was always present. The urinary history was always one of oliguria: sometimes no water had been passed for 6–24 hours previously, sometimes small quantities had been recently voided with strangury; more commonly strangury was associated with hypogastric pain. In most cases there was no evidence of a full bladder, but in 3 the bladder was palpable 2 to 3 in. above the symphysis. Certain constitutional changes also were noted, though not constantly. Vomiting, either associated with or shortly preceding the dysuria, was a feature of 8 cases. Onset or increase of headache was a fairly constant complaint. Consciousness became increasingly clouded in those cases where such clouding was a presenting symptom of the head wound. Pallor with slight facial œdema of the type seen in nephritis was sometimes observed soon after the dysuric symptoms, and in one case was remarked on before their onset.

URINE

Routine urinary examination, including pH and microscopy, in all cases, 24 and 72 hours after the start of diazine therapy, was undertaken when facilities were available. Some 90 cases were so examined. All cases with dysuria had immediate urinary examination as soon as specimens were obtainable.

There were three constant urinary findings. These were an acid pH, blood-cells in the urine, and a deposit consisting chiefly of amorphous crystals. There were in addition a small number of brown crystals having the shape of two opposing segments of a circle, the segments being radially striated. Blood-staining was usually recognisable to the naked eye as a pink discoloration, and occasionally in a poorly responsive patient this would be noted before the onset of other symptoms. The urine was invariably acid.

In no case of definite dysuria was the pH more than 6·5. Moreover the incidence of sulphadiazine deposit without symptoms was itself very rare in urine of greater pH than this; 4 cases of this type were found, the pH being 6·5, 7·0, 7·5, and 6·3. It is probable that others of this sort were missed in the absence of routine urine microscopy. It seems that the likelihood of sulphadiazine dysuria, even with heavy dosage, is minimal if the urinary pH can be maintained at 7·0 or over. This reading was established in 68 of the 90 cases tested, and in some of those, where the pH was lower, doubts were legitimately raised as to the amount of alkali actually taken. It is of interest that no symptoms of alkalosis were noted in these cases despite the heavy alkali intake.

TREATMENT

If the syndrome is recognised early the basis of treatment is the withdrawal of the offending drug and the production of optimum conditions for the rapid formation of large amounts of alkaline urine.

The method we employed was to put up an intravenous drip of 4% sodium bicarbonate and 4% sodium citrate, 1 bottle (540 c.cm.) to be followed by glucose-saline, 5–6 bottles, in 12 hours. If intravenous alkali is not available no delay should be made in setting up a rapid intravenous drip of saline or sodium sulphate, and pending the preparation of intravenous alkali, this should be given by mouth, sodium bicarbonate gr. 30, sodium citrate gr. 30, hourly, until the production of an alkaline urine. Glucose-saline alone, with alkali by mouth, will sometimes clear the condition. In the last 12 cases intravenous therapy was all that was needed to produce a flow of alkaline urine in 6–12 hours, and the patients made an uninterrupted recovery.

In the first 5 cases, when we were less familiar with the syndrome, ureteric catheterisation was undertaken. In 4 cases both ureters were found blocked by sludge, which on microscopy proved to be red blood-cells, epithelial debris, and diazine deposit. In the fifth case the block was right-sided only.

In 5 of the series blood-urea was estimated. Of these 5, 3 had ureteric catheterisation performed with the finding of bilateral block, the blood-ureas being 250 mg., 200 mg., and 67 mg. per 100 c.cm. The other 2, which did not have catheterisation, showed readings of 97 mg. and 130 mg. per 100 c.cm. In both these cases blood-ureas 24–48 hours after the usual intravenous therapy showed values of 30 and 37 mg. respectively. These results suggest that even with a raised blood-urea and presumed mechanical ureteric block, the intravenous therapy is sufficient to re-establish urinary flow. However, if the clinical condition suggests a raised blood-urea, confirmed on estimation, and intravenous fluids do not produce a reasonable urinary output in 12 hours, catheterisation should undoubtedly be considered. A rising blood-urea after the inception of intravenous therapy—an improbable event in our opinion—would be an indication for immediate catheterisation. It should be emphasised however that this is never a substitute for intravenous therapy.

POST-MORTEM FINDINGS

One patient in this series died of a brain abscess, 3 days after urinary flow had been re-established. He had had a blood-urea of 200 mg. per 100 c.cm. and catheterisation had shown a bilateral block. Macroscopically the kidneys were of normal size and colour. The pelves contained a small amount of sludge similar to that found on catheterisation, and there were subepithelial ecchymoses in each. On section the tubules and glomeruli were normal, except for a few red cells seen in occasional glomeruli.

In several other cases dying during the course of diazine therapy, a similar sludge was noted in the kidney pelves. These patients had not had clinical dysuria, and no urinary microscopy had been done.

SUMMARY AND CONCLUSIONS

In a series of 450 head wounds treated with high sulphadiazine dosage 17 cases of dysuria were seen. The incidence bears a close relation to urinary pH; no case occurred with a pH of over 6·5. No sulphadiazine deposit was found in any urine examined with a pH of over 7·5. Neither total dosage nor length of administration appears to affect the incidence.

The clinical picture is clear-cut: intense abdominal pain with loin tenderness, oliguria, and bloodstained urine are the presenting symptoms.

Prophylaxis depends on the control of urinary pH and output. Treatment is by intensive intravenous fluids with alkalis. In only 5 cases was ureteric catheterisation done, and it was probably necessary only in 2. None of these cases was fatal, though 1 died of other causes shortly after urinary symptoms had cleared.

Our thanks are due to Major R. V. Facey and his laboratory staff for the pathological investigations, done often despite the heavy pressure of other work, and to Lieut.-Colonel C. J. Cellan-Jones, who performed 2 of the ureteric catheterisations.

ASSAY OF DIGITALIS AND STROPHANTHUS.—The Laboratory of Hygiene, Department of National Health and Welfare, Ottawa, has adopted a cat method for the assay of digitalis and strophanthus preparations in place of the previous frog method. The cat method will be used for the enforcement of regulations under the Food and Drugs Act from Oct. 5, 1945.

PASTEURELLA SEPTICA INFECTION OF A CAT-BITE WOUND

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A NUMBER of cases have now been reported in which organisms identified as *Pasteurella septica* were isolated from wounds caused by animal bites. These cases have

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necrosis

included three dog-bites in their series. This note records another case of *Past. septica* infection which followed a cat-bite.

CASE-HISTORY

A man, aged 57, was treating a sick cat when he was bitten over the terminal interphalangeal joint of the right index finger. Next morning the finger was red and swollen, and his doctor prescribed fomentations and a full course of sulphonamides. There was little improvement after a fortnight, and he was admitted to hospital for surgical treatment. The appearance of the finger suggested a tendon-sheath infection, but against this was the relative lack of pain on movement and the absence of constitutional disturbance. An X-ray film showed necrosis at the base of the terminal and the head of the middle phalanx. At operation there was no superficial pus, but some loose granulation tissue was found near the tendon sheath, and a scraping of this was sent for bacteriological examination. The tendon sheath was œdematous, but did not contain frank pus. The finger was packed with sulphonamide-impregnated gauze and immobilised in plaster, and the wound finally healed a month after the operation.

[illegible] There was resi- [illegible] it. Cultures of [illegible] yielded a gram-negative coccobacillus which has since been identified as *Past. septica.* It was unfortunately not possible to attempt the isolation of a similar organism from the cat's respiratory tract, because the animal was destroyed by its owner shortly after the accident.

BACTERIOLOGY

Morphologically, this organism, the laboratory number of which was E 8002, consisted of short, rather ovoid rods, 1μ in length, arranged singly and in pairs. A few elongated, almost filamentous forms were present in most cultures. There was a suggestion of bipolar staining. It was gram-negative and non-acid-fast. No spores and no capsules were demonstrable. The organism was non-motile when tested after varying periods of growth at both 37° and 22° C.

Cultural characteristics.—On primary isolation, growth was obtained only on enriched media, but later subcultures grew readily on ordinary agar plates. Cultural appearances on various media were as follows:

Horse-blood agar plates.—After 18 hours' incubation at 37° C, there were low convex, transparent colonies 0·5 mm. in diameter with a smooth mirror-like surface and an entire

After [illegible] days incubation, the medium was slightly cleared and browned.

Gelatin stab.—7 days' incubation at 22° C gave a filiform growth without liquefaction.

Broth.—2 days at 37° C gave a good growth with uniform turbidity and a slight deposit. After 5 days there was an abundant deposit which swirled up but was not disintegrated on shaking. Slight ring growth at the surface.

MacConkey plate.—No growth after 3 days at 37° C.

Metabolism.—Growth was equally good aerobically, anaerobically, and in an atmosphere containing 10% CO_2 when large inocula were used. When tested, however, with small inocula of about 20,000 organisms on agar slopes, it was found that anaerobic conditions were necessary for the initiation of growth. The optimal temperature was 37° C; growth was very scanty at 22° C. Growth was improved by the addition of blood but not appreciably by serum.

Biochemical reactions.—Acid without gas in glucose, mannitol, and sucrose, and slight acidity in galactose. No fermentation of lactose, maltose, salicin, dulcitol, adonitol, inulin, rhamnose, arabinose, xylose, inositol, raffinose, or sorbitol. No change in litmus milk. Indole ++. MR −. VP −. Nitrate reduction ++. H_2S −. Catalase +. NH_3 ++. Methylene-blue reduction +.

Pathogenicity.—Two mice inoculated intraperitoneally with 0·2 ml. of a 24-hour broth culture died within 48 hours. Both showed sticky fluid in the pleural cavity and one had pus in the peritoneal cavity. Cultures from heart and spleen were positive, and direct films of the heart blood showed bipolar-stained gram-negative rods in large numbers.

Serology.—Complete serological confirmation of this strain, E 8002, has not been achieved, but this inst

agglutinability of *Past. septica* suspensions. An agglutinating serum of titre 1/1280 was prepared in a rabbit by intravenous inoculation with graded doses of a steamed and phenolised suspension of E 8002. Agglutination tests were attempted with ten *Past. septica* strains, some obtained from the National Collection of Type Cultures and including representative strains from the serological groups of Cornelius (1929), and some freshly isolated strains kindly sent by Dr. McGaughey of the Institute of Animal Pathology, Cambridge. Two strains were found to be agglutinated by th rum prepared

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source and the latter was used as homologous serum to 1737 in the agglutination and absorption tests performed. The results of these tests are shown in the following table:—

Organism	Sera			
	Unabsorbed E 8002	Unabsorbed *Past. suiseptica*	E 8002 absorbed with 1737	*Past. suiseptica* serum absorbed with E 8002
E 8002	1/1280	1/320	1/640	—
Past. suiseptica 1737	1/320	1/960	—	1/480

As the table shows, there was some degree of cross-agglutination and possibly partial cross-absorption of agglutinins between the two strains and their sera, but a reduction of only 50% in the titre after absorption cannot be regarded as significant.

(ii) A *Past. septica* strain "Turner" from the Institute of Animal Pathology, Cambridge. The following table shows the results obtained with this strain:—

Organism	Serum	
	Unabsorbed E 8002 serum	E 8002 serum absorbed with "Turner"
E 8002	1/1280	—
"Turner" pasteurella ..	1/320	—

The dilution of serum in the first tube of the agglutinating test done with the ab

reduction in

least 67%

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rough.

A specimen of the patient's serum obtained six weeks after the injury did not agglutinate E 8002.

DISCUSSION

The clinical course of this case resembled that of others which have been published. The striking contrast between the acute onset and the subsequent relatively benign course was noted by the surgeon while the patient was in hospital. It was thought that the sulphonamide therapy might have overcome a coincident streptococcal infection during the first few days after the injury, but other recorded cases with a similar history have received no sulphonamides.

We wish to thank Dr. W. Russell Scott, who first saw this patient, and Mr. Ross Steen, FRCS, who operated on the infected hand and gave us clinical details of the case.

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Medical Societies

ROYAL SOCIETY OF MEDICINE

AT the annual general meeting of the section of psychiatry on May 24, with Dr. A. F. TREDGOLD, the president, in the chair, a discussion on

Biochemistry and Psychiatry

was opened by Mr. G. D. GREVILLE, PH D, with a paper on recent developments. He dealt first with the hippuric acid excretion test in schizophrenia. The finding of Quastel and Wales of an abnormally low excretion in 100% of catatonics and only 15% of other schizophrenics could not be confirmed by Ström-Olsen and colleagues. Two other groups of workers were in partial agreement with Quastel and Wales. Hippuric acid synthesis was now known to depend on body-weight, but, as Mr. Greville showed by scatter diagrams, the disagreement between Quastel and Wales and Strom-Olsen was not due to neglecting the weights of the patients. *Nevertheless it was clear that* body-weight should be taken into account in future work. Speaking next on spontaneous hypoglycæmia, Mr. Greville pointed out that in addition to hypoglycæmia with a clear organic basis there existed a "functional hypoglycæmia," which had to be differentiated from psychoneurosis with incidental hypoglycæmia. Rennie and Howard had recently described the syndrome of "tension-depression with hypoglycæmia," in which hypoglycæmic episodes appeared only *after* food. These episodes failed to appear after treatment of the psychiatric disorder. During hypoglycæmia many crimes and offences had been committed, and hypoglycæmia had several times led to divorce proceedings on the grounds of cruelty. Hypoglycæmia was frequent in children, and peace in the home might be secured by a piece of candy (Wilder). Dealing next with the oral glucose-tolerance (OGT) test and depression, Mr. Greville summarised the work of McCowan and Quastel on the close parallelism between the hyperglycæmic index (HI) and emotional tension. Some subsequent workers were less sanguine, but he could not give an opinion. Gildea and co-workers, from a comparison of oral and intravenous tests on manic-depressives, believed that the abnormal OGT curves often found could be explained by defective absorption of glucose from the alimentary tract. Some work by Dr. D. Russell Davis and Mr. Greville with depressed patients on a constant carbohydrate intake supported this view. They had found that in the OGT curve the lower the initial rate of rise the more sustained was the hyperglycæmia. He was encouraged in the belief that the initial slope of the OGT curve gave an indication of the rate of glucose absorption by finding that it was correlated with the time in which iodide appeared in the saliva of the same patients after ingestion of potassium iodide (Heath and Fullerton's test). It might be inferred that, at any rate when the daily carbohydrate intake was constant, the most important factor determining the shape of the OGT curve was absorption from the alimentary tract. Discussing next the oxygen consumption of the brain, Mr. Greville said that this was estimated in man by determining the arteriovenous difference for oxygen content, and multiplying by the rate of blood-flow. Although it was open to criticism, the "plethysmographic method" of Ferris was the only one giving a value for total intracranial blood-flow. Gross cerebral metabolism in schizophrenia appeared to be normal although arteriovenous differences and blood-flow had not been determined simultaneously, and this should be done. Himwich believed that cerebral metabolism was reduced in some forms of mental deficiency. Reduction in cerebral oxygen- and glucose-uptake during insulin hypoglycæmia was now established. Probably the same occurred during convulsion therapy, but the proof was incomplete. Belief that reduction in cerebral respiration was the factor common to the various therapies had led workers to try partial asphyxiation as a treatment for schizophrenia, with inconclusive results. The effect of short sharp hypoxia might better be tested in the affective psychoses, where convulsion therapy was more successful. Mr. Greville made a plea for even more cooperation and facilities. Biochemists wanted blood from inconvenient places like the internal jugular vein; and for metabolic work research wards were needed, adequately staffed with conscientious nurses. Help was wanted from clinical research officers, who would select the patients, follow their progress for years, and so on.

BIOCHEMICAL ASPECTS OF ANXIETY

Dr. DEREK RICHTER first cited some recent work on biochemical changes produced by emotion. Milhorat and his associates had reported that the blood of patients with anxiety contained a labile substance, detected by its action on smooth muscle in vitro, which was absent from the blood of normal subjects. It was well known that anxiety might affect the endocrine balance, but the demonstration by Gellhorn and colleagues of an increase in the insulin content of the blood in emotional excitement was a useful advance, since this was an effect which could be measured quantitatively by biological assay. Emotional hyperglycæmia in human subjects had been frequently reported, but many workers had been unable to confirm its occurrence. Dr. Richter had obtained further information on this subject while working at the Neurosis Research Centre at Mill Hill. He had estimated the blood-sugar during air-raids both of normal subjects and of patients with anxiety states. About a third of the subjects had shown a rise in blood-sugar, but the rise was only slight, and it was doubtful whether emotional hyperglycæmia was of great importance in man. In further work at Mill Hill he had shown that the choline esterase activity of the blood-serum was increased in acute anxiety and depression, and in post-concussional states. An increase could also be produced in normal subjects by vigorous exercise or exposure to low temperatures (cold baths); this was attributed to increased autonomic activity. The change in activity occurred only with choline esterase; no such increase in concentration had been found for other enzymes (e.g., serum amylase) or for serum-proteins. There had recently been a tendency to depart from the ideas of Cannon and his associates regarding the somatic changes associated with emotion. Dr. Richter considered that in acute emotional states there was a general lability of autonomic control. This might involve almost any biochemical attribute. Although some changes were found more often than others, there was little evidence that these served any useful biological purpose, unlike the changes assisting "flight or fight" in Cannon's animal experiments. Further, the pattern of response showed considerable variation between different subjects. The problem arose as to why, in situations of sufficient stress, some individuals developed anxiety states while others did not. There was evidence that certain biochemical factors might be of significance here, notably hypoglycæmia, vitamin-B_1 deficiency, and adrenaline release. Anxiety might be a symptom of almost any physical disability to which the subject was unable to adjust himself. Recent studies of the "effort syndrome" had shown how a biochemical lesion, which caused a reduction in physical efficiency, could lead to the appearance of an anxiety neurosis. Finally, Dr. Richter referred briefly to the work of Denis Hill and his colleagues at Sutton with the electroencephalograph.

* * *

Mr. J. H. QUASTEL, D SC, FRS, emphasised the importance of the closest collaboration and understanding between psychiatrist and biochemist. Both were specialists, and mutual trust was essential. He was impressed by the disagreements between psychiatrists in the diagnosis of borderline cases. The overlap between various psychiatric disorders was wide, and apparently [illegible] over [illegible] mity [illegible] cose- [illegible], he pointed out that Lockwood has observed a parallelism between the HI and the affective state as indicated by the psychogalvanometer. There was thus a correlation between HI and an objective measure of tension. He felt that anoxia must play some part in causing the remissions due to shock treatments. Lack of evidence that the respiratory exchange of the brain was abnormal in schizophrenia did not prove that there was no abnormality in some part of the respiratory enzyme system of the brain. The apparently simple process of oxygen utilisation by tissues was in fact extremely complicated.

Mr. R. BENESCH, B SC, summarised studies of nicotinamide deficiency syndromes at the Maudsley Hospital. With Dr. P. Ellinger he had elaborated an eight-day saturation test for [illegible], based on the finding that [illegible] is the main metabolite of [illegible] body. Excretion of nicot[illegible] sharply when succinylsulphathiazole was given, pointing to a bacterial synthesis of nicotinamide, inhibited by the drug. The mixed flora obtained from the human cæcum had been shown to synthesise nicotinamide under [illegible] content of the [illegible] as the principal [illegible], but the type of diet was of crucial importance, since protein by encouraging intestinal coliforms would stimulate synthesis. That was why milk and eggs prevented pellagra though they [illegible]

He considered that all patients with acute psychoses, whether manic-depressive or schizophrenic, passed alternately from delirium to stupor. It was better to present to the biochemist symptoms such as delirium, stupor, and anxiety rather than the usual diagnoses.

In the discussion which followed, Dr. QUASTEL asked whether serum choline esterase should be regarded as "true" or "pseudo" choline esterase.—Dr. RICHTER thought the former.—Mr. GREVILLE asked whether Dr. Richter's fin[illegible] anxiety would invalidate the u[illegible] esterase level as an indicator o[illegible]CHTER thought not, as the reduction with impaired liver function was large enough to overcome the effects of anxiety.—Dr. ISABEL WILSON asked why dogs could detect anxiety and fear in human beings, which they were said to do through their sense of smell.—Dr. RICHTER thought that they could not smell adrenaline, as its vapour pressure was so low, but believed they might smell the perspiration accompanying anxiety.—Dr. WILSON also asked about the pellagra-like symptoms in sulphonal poisoning.—Mr. BENESCH thought they were more likely to be due to the action of the drug on the liver than on the intestinal flora.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

A MEETING of this society was held on April 6.

Primary Carcinoma of Fallopian Tube

Dr. [illegible] 1847 [illegible] 0·5% [illegible] of ab[illegible]

1. A woman of 39, who had had one child 17 years before, complained of bearing-down pain with occasional gushes of clear fluid per vaginam which seemed to bring relief. The uterus was definitely enlarged and fullness could be felt in both fornices. Supravaginal hysterectomy with removal of both appendages was performed. Both tubes were found to be closed and dilated, and contained clear fluid. Projecting into the cavity of the left tube was a mass the size of a thumbnail which proved to be a papillary adenocarcinoma. Soon after returning home she developed ascites and swelling of both legs, and she died within a year.

2. A woman of 55, a virgo intacta, who had had slight postmenopausal hæmorrhage for two months, noticed gushes of clear fluid while playing golf, but diagnostic curettage revealed nothing abnormal. Six months later a large pelvic mass could be felt to the right of the uterus, having a fungating projection into the vagina. [illegible] Though histologic[illegible] a primary carcinoma of the fallopian tube.

3. A woman of 60, who had had two children, complained of a bloodstained discharge for five weeks; and she thought that she was having sudden losses of urine accompanied by lower abdominal pain on the left side. On dilatation of the cervix several ounces of fluid escaped, which was not urine. Bimanual examination showed a soft mass in the left lateral fornix. Panhysterectomy was performed, and a solid tumour (1½ × 1½ in.) was found just proximal to the fimbriated end of the left tube. The uterus contained a small endometrial polypus.

Doran describes a watery discharge in nearly half of such cases, and it seems to be the most characteristic symptom. Pain sometimes (but not always) accompanies it. The expectation of life is apparently short. This type of cancer is resistant to irradiation.

Peroneal Palsy following Parturition

Miss ELEANOR MILLS said that though the condition was described by von Basedow in 1838, only 107 cases had been reported by 1930. Nevertheless 7 cases had been collected from the records of local hospitals within three years.

1. The first patient was a 2-para, aged 37, who two years previously had had a 9½ lb. baby with difficulty and forceps. Soon after delivery dorsiflexion of the left ankle had been impaired, and it was six months before she was able to get about. She had a contracted true conjugate, and a narrow subpubic angle and outlet. She still dragged her left foot slightly, and tended to walk on the ball of the foot, and there was some wasting of the anterior tibial group of muscles on the left side. Labour, induced about three weeks before term, progressed satisfactorily except for low forceps. A live child of 8½ lb. was delivered, and there were no signs of peripheral nerve damage after this delivery.

2. The second [illegible] of the pelvis. The head [illegible] rotation and forcep[illegible] force was needed for extraction. The child was delivered strictly in the antero-posterior position. A stillborn 9 lb. baby was produced. Next day pain, numbness, and tingling appeared over the outer aspect of the left thigh and the whole of the leg and foot. Full dorsiflexion could not be obtained, and over the dorsum of the foot there was diminution of epicritic sensation. By the sixth day she had regained full dorsification and all disturbances of sensation had disappeared.

3. A primigravida had a long labour. The presentation was occipito-posterior, and manual rotation and forceps extraction was performed with difficulty. A stillborn baby was delivered. Seen by Miss Mills ten weeks later she proved to have a generally contracted pelvis. She limped badly, and had complete loss of eversion and extension of the ankle, but all sensory symptoms had disappeared.

4. A primipara, aged 34, with ample measurements and a left occipito-anterior presentation, had a long first stage (77 hours) followed by a mid-forceps extraction. Delivery of the 8 lb. child was exceedingly difficult. She had pain in the right leg, and paresis of the anterior tibial and peroneal muscles of the right leg was found. Foot-drop was still evident on leaving hospital.

5. A 6-para was in labour 41 hours, with a brow presentation. Craniotomy was necessary. Two days later pain appeared in the right leg and then paresis followed. She was treated by passive movements, and by the time of discharge the condition had cleared up.

6. In the sixth case manual rotation was required after a fairly normal labour, and an 8½ lb. [illegible] xtracted with [illegible] was felt in the [illegible]. No sensory [illegible] later paralysis of the dorsiflexors of the left foot was still nearly complete.

7. The seventh patient had persistent albuminuria, and labour was induced by rupturing the membranes at 35 weeks. The position was left occipito-posterior; a deep transverse arrest of the head occurred, but manual rotation [illegible] extract[illegible] culty. [illegible] dorsiflex[illegible]. There was no sensory loss. A month later there was still some paresis.

In these cases one or more of three essential factors are always present: disproportion, prolonged or difficult labour, or instrumentation. The upper roots of the sacral plexus lie against the bony walls of the pelvis and may thus be exposed to pressure. Dorsal offshoots of these nerves receive the chief injury. The external popiteal nerve is made up of these fibres, and therefore paralysis is chiefly located in the distribution of this nerve. The main mass of the sacral plexus is to some extent cushioned by the pyriformis muscle. It would seem that the plexus is in a more vulnerable position in the generally contracted pelvis than in the rachitic pelvis, in which there are deep niches on either side of the projecting vertebral promontory. In only two of the above cases was the paralysis on the side where the pressure from the fœtal head would be expected. It must be supposed in four of them that the peroneal nerve was damaged by instrumentation.

Lower-segment Cæsarean Section

Dr. K. V. **Bailey** said that in the eleven years since his last communication[1] his series has increased by 285 cases of which 75% have been elective. In these the operation has been carried out twice in 45 cases, three times in 4, and four times in 1. He has records of 5 cases in which delivery through the pelvis was effected after a previous lower-segment cæsarean section. There were 2 maternal deaths (from pneumonia following heart disease and from tuberculous meningitis following phthisis) and 3 children failed to survive (atelectasis—? premedication). The indications for operation included contracted pelvis or disproportion (108), bad obstetric history, (37), persistent malpresentation (36), placenta prævia (22), elderly primigravida (17), uterine or pelvic tumour (15), previous classical cæsarean section (12), impacted breech in a primigravida (11), and heart disease (7). During the last fifteen years Dr. Bailey has never been in two minds about the superiority of this operation over the older classical, which he has abandoned. Wherever he has performed the lower-segment cæsarean section more than once in the same patient he has always been gratified to find perfect healing of the lower segment, with almost universal lack of adhesions to the scar. In only 2 cases were omental adhesions to the corners of the uterine scar found. "This proves the facility of drainage from the incision and the absence of effusion through the peritoneum. In fact it proves the safety of the operation vis-a-vis the classical—a fact which is further evidenced by the universal smoothness of the convalescence."

Dr. Bailey now regretted that only 31 of his cases were operated on under local anæsthesia: "I must say that I have come to this procedure rather dilatorily." Nevertheless the perfect premedication for all types is difficult to find, and there is no doubt that a certain proportion of patients do feel pain or gross discomfort during the operation and apprehension before it in spite of sedative drugs. A well-trained nursing staff is essential to deal with the mental and physical preparation of the patient, and a well-trained theatre staff to assist at the operation. The possible effects of the premedication on the child must also be considered: "I have had no fœtal deaths myself in these cases, but I have had to work on 3 of the children following delivery after premedication by 'Omnopon' (gr. $\frac{1}{3}$) and scopolamine (gr. $\frac{1}{150}$)."

In conclusion Dr. Bailey reiterated his views of 1934, to the effect that the lower segment operation is the operation of choice in all cases—not excluding placenta prævia. "It can be used in clear, suspected, or infected cases without jeopardising the general condition of the patient or exposing her to peritonitis. It allows the use of trial labour, avoids embryotomy of the living fœtus, and permits the development of subsequent pregnancies without fear of uterine rupture."

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[1] *Lancet* 1934, i, 672.

Messrs. **Smith & Nephew** (Hull) have issued a new edition of their little volume on *Cellona Technique* which will be sent to any practitioner on request. In addition to useful descriptions of routine plaster methods, there is much new material on the use of plaster in the treatment of burns and wounds. Immobilisation in tuberculous conditions is outlined.

Reviews of Books

Atlas of the Blood in Children

Kenneth D. Blackfan, MD, late professor of pediatrics, Harvard University; **Louis K. Diamond**, MD, assistant professor of pediatrics in the university. Illustrations by C. M. **Leister**, MD, associate physician, St. Luke's Hospital, Bethlehem, Penn. (Oxford University Press. Pp. 320 + 70 plates. 66s. 6*d.*)

This copiously illustrated volume is a good deal more than an atlas of blood-pictures; it is, in fact, a short comprehensive handbook of blood diseases in children, based on information gathered from some 5000 cases, surely unique material. The plates are very well done and beautifully reproduced, but in this, as in other atlases, it is difficult to see what use there is in illustrating aplastic anæmia and other anæmias; of the 28 plates devoted to anæmias not more than 6 give really useful information. A short description of the development of the blood-cells is followed by a brief clinical description of the various diseases and full sections on treatment, with illustrative case-records. The bibliography is moderately useful, predominantly American. The authors note the lability of the blood-picture in childhood up to the age of 6 years, and blood-counts at the various ages are given in a table. Interesting unfamiliar anæmias described in the book include congenital hypoplastic anæmia which may clear up after repeated transfusion, and the anæmia of prematurity which recovers spontaneously but cannot be hurried by any known hæmatinics. They point out that in children of anæmic mothers the anæmia which normally occurs about the age of 4 months tends to persist. Von Jaksch's disease is deliberately omitted since the authors consider that this blood-picture may be produced by several causes. A discussion of "congestive splenomegaly" and the long section on Mediterranean anæmia deal with conditions not often seen here.

The only serious fault is the out-of-date nomenclature used in describing red-cell development. Even American writers now, for the most part, confine the term "megoblast" to a distinct series of pathological cells; true megaloblasts are the only omission from this atlas, and the failure to realise their significance has led to some confusion in the section on anæmias. It is indeed remarkable that all mention of the bone-marrow should have been omitted. The really comprehensive atlas of blood diseases in children remains to be produced, and with the facilities the Harvard School possess Dr. Diamond may give it to us in the future. The death of Dr. Blackfan, in 1941, may account for omissions in the present volume, which even in spite of them, is unique and valuable.

Pulmonary Tuberculosis

A Handbook for Students and Practitioners. R. Y. **Keers**, MD EDIN., FRFPS, medical superintendent, Tor-na-Dee Sanatorium; B. G. **Rigden**, MRCS, first assistant medical officer at the sanatorium. (Livingstone. Pp. 268. 17*s.* 6*d.*)

Dr. F. H. Young in his foreword says that it is time pulmonary tuberculosis was presented to the student in a newer way. Dr. Keers and Dr. Rigden have done this in a book which reviews all aspects of the disease as we know it today. The position of pulmonary tuberculosis is changing, but the book is none the less valuable on that account, since much of it is concerned with well-established facts. In some ways it is uneven however. The chapter on examination of the patient is unnecessarily elementary: the student would hardly expect to look in such a book for the elements of percussion and auscultation; the space used in this way might have carried fuller descriptions of the fine reproductions of X-ray films. The chapters on prognosis and treatment are well set out: here the authors are obviously drawing from their practical experience and approach their material from a fresh and unconventional angle. Aftercare of the tuberculous patient—a subject of special interest to the general practitioner—is disappointingly sketchy, the medical supervision of quiescent cases occupying little more than a page. On the whole, however, the book is useful, in clarifying many current problems in the care of pulmonary tuberculosis.

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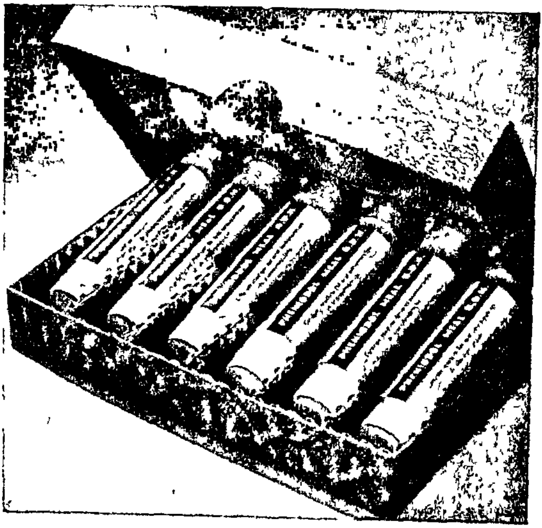

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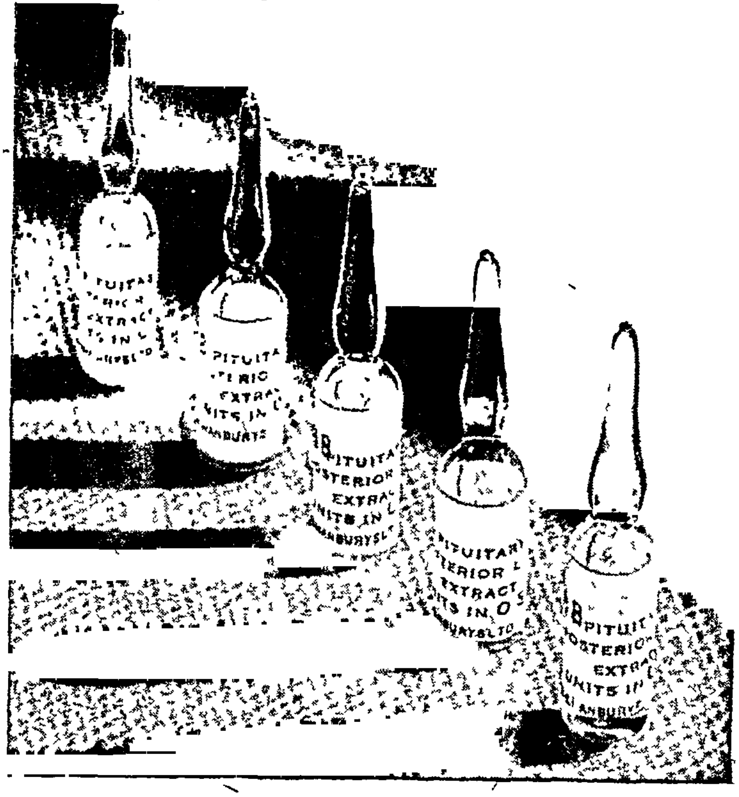

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THE LANCET

LONDON: SATURDAY, JUNE 16, 1945

Time, Place, and Circumstance in War Surgery

WAR has always been a test bench on which surgical theory and surgical methods are put to the proof. In the days before LISTER, surgeons learned their art at the wars. In more recent times, when surgical advance has been continuous, war has provided a recurring experiment on a grand scale in which the fundamental problems can be studied anew under conditions that are reasonably uniform and in sufficient numbers to eliminate chance, and in which methods introduced since the previous war can be evaluated. This war has provided such an experiment, and now that its European phase is over, we can look back over the lessons of the past six years. Above all we have relearnt the chief lesson of the last war—that repair of injury and resistance to infection are tasks which healthy tissues can perform with amazing efficiency, and that the chief duty of the surgeon is to study the processes by which Nature works, to help them where possible, and never to hinder them by meddlesome interference. We have learnt many new ways in which we can help by maintaining the effectiveness of the general processes of immunity, and we have been able for the first time to damage the powers of bacteria without harming those of the tissues. In the varying fortunes of our armies in every corner of the globe we have also learnt the danger of orthodoxy. There are no correct methods in war surgery. There are established principles, but the way in which those principles should be applied varies with time, place, and circumstance. The terrain in which the campaign is being fought; the climate and the time of year; the severity of the action, its success or failure, and the speed of advance or retreat; the weapons principally employed; the prevalence of disease among the troops and the state of exhaustion, dehydration, exposure, and mental strain of the soldiers when wounded; the time lag between injury and first-aid and between first-aid and arrival at an organised surgical centre; the conditions under which these centres are working, their housing, their light and ventilation, their supplies, their exposure to air attack, their complement of orderlies and nurses; the number of casualties arriving at a time; the length of the lines of evacuation, the smoothness of transport and the facilities for supervision during the journey, the spacing and adequacy of medical units on the way; the distance of the centres of definitive surgery and their establishment in beds and personnel in relation to the numbers reaching them—all these things modify the methods of the war surgeon and govern his results.

It is tempting to ascribe improved [illegible] have worked. The state of the casualties coming back from Europe has been magnificent. While giving every credit to the organisation and personnel of the BLA, we must remember that the campaign in which they were engaged was the final blow in the struggle; that our armies were overwhelmingly superior in all weapons; that the medical formations were better served than ever before; that never in the history of war have such short lines (in time rather than distance), such abundant medical personnel in relation to casualties, and such smooth transport been known before. Similarly in comparing statistics from different fronts at the same time, and from the same front at different times, we must make due allowances for circumstances. The recovery-rate in abdominal wounds in the BLA has exceeded that in the CMF; but every war surgeon knows that the result in these grave injuries depends largely on circumstances outside his control. LOWDON,[1] who has been with a forward unit in the Desert, in Italy, and in Northern Europe, found that the nearer he worked to the line, the greater the proportion of serious injuries he received and the higher his mortality. He also found that his death-rate for abdominal wounds was appreciably higher when his patients were physically exhausted, as they were in the first fortnight of the Sicilian campaign, than it was earlier in the Desert and later in Italy. BLA figures are those which a group of good surgeons should get under satisfactory conditions; CMF figures are those that the same surgeons might be expected to produce under more difficult conditions; and they are in each case matched by results in earlier campaigns in this war when conditions were equally favourable or adverse. The remarkable results with delayed wound suture reported in our issues of May 12 and 19 by Brigadier EDWARDS, Brigadier STAMMERS and their colleagues in the CMF again demonstrate what good surgeons can attain when conditions are satisfactory, rather than any new surgical procedure or any spectacular advance in method peculiar to Italy. The CMF figures, despite transfusion, penicillin, and the many auxiliaries to disinfection and tissue repair that help the modern surgeon, are substantially the same as those of small groups of surgeons in the BEF in 1917. But in Italy the conditions of warfare made it possible for a fine organisation to extend the benefits of delayed suture to a far higher proportion of wounded men.

The principles of the surgical treatment of soft-tissue wounds are simple: they are excision at the earliest possible moment, and suture at the earliest safe opportunity. The first principle [illegible], needs no [illegible], Latin, or [illegible], every surgeon uses a similar layer-by-layer technique in excising dead, damaged, and soiled tissues from a wound track. But the ability to excise is very much limited by the surgical potential of any force in relation to its casualties. Ten surgeons can excise 150 wounds a day but they cannot excise 1000; and if they are overwhelmed by numbers they may have to resort to much simpler procedures, relying on free drainage, immobilisation, and the administration of sulphonamides (for any penicillin routine depending on frequent parenteral administration would inevitably break down under the same hard conditions) for the safety of their wounded. The second principle, early suture, needs some elaboration. A wound may be closed by primary, delayed primary, or secondary suture. These terms cannot be defined with any exactness, for each may merge into the other, but they mean closure at three different stages in the process of repair. Primary suture means suture at the end of the operation of excision, while the wound surfaces are still fresh. Delayed primary suture means suture after an interval, but an interval so short that the cut tissues have much the appearance of a fresh wound, and can be sutured without further trimming. Delayed primary suture is usually performed within the first week. Secondary suture means suture after the wound surfaces have been sealed off by the processes of repair—that is, when the tissues are covered by a layer of healthy granulations. This process is rarely complete till the third week. Secondary suture therefore implies re-excision of the wound surfaces and reconstitution of its original planes, and suture of the fresh surfaces so formed. A pronounced difference between surgical policy in this war and the last is that primary suture is now frowned on as an unwarranted gamble at the patient's expense. It is unwarranted because the results of delayed primary suture are as good, or nearly so. It is a gamble because the trapping of discharges and the setting up of tension which may follow suture can lead to cellulitis, gangrene, or even death if virulent organisms are present in the wound. Which method of suture is employed depends on circumstances rather than policy. Delayed primary suture, which saves suffering, time, materials, and hospital beds, will obviously be chosen where circumstances are good. But where the number of casualties is considerable in relation to the surgeons who have to operate on them and the nurses who have to look after them, where the base hospitals are distant and the journey rough, secondary suture must be preferred. When conditions are still worse, when the number of casualties is really great, and particularly where they are all retained near the place of wounding, as they must be in any beleagured town or island, or in a force whose advance outstrips its transport, as in CUNNINGHAM's dash through Abyssinia, the closed-plaster technique comes once more into its own.

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[1] Lowdon, A. G. R. *Edinb. med. J.* 1945, 51, 257.

Psychiatrists in Harmony

THERE is no better way of disproving the assertion that the State is seriously divided within itself than for it to speak with one voice. Psychiatry, which has often been said to suffer from faction, has taken the same method of demonstrating that on the main matters affecting the development of their specialty the schools see eye to eye. The memorandum on the Future Organisation of the Psychiatric Services[1] now put forward by committees of the Royal College of Physicians, the Royal Medico-Psychological Association, and the British Medical Association is a plain indication that they know what they want and that their collective voice is not discordant. Moreover they make it clear that it is a prime aim of psychiatrists to further the closest relationship between psychiatry and general medicine. It is recognised that there are special features in psychiatry which seem to distinguish it from other forms of medicine, and these characteristics are described and examined in frank detail; but the scrutiny leads to a reaffirmation of the need for psychiatry to be fully integrated into medicine.

Following their cardinal principle that psychiatry should in all essential respects be treated like other branches of medicine, the sponsors of the memorandum have advocated a more adequate measure of domiciliary consulting service, outpatient consultant centres (to be attached to all general hospitals of appropriate size) and inpatient accommodation in teaching hospitals and the larger non-teaching hospitals. Their proposals regarding medical staff would entail drastic changes in the pre-war system which separated the mental hospital doctor, employed full-time by a local authority, sharply from the consultant and the psychotherapist. The interchange of staffs between the voluntary and the municipal psychiatric departments or hospitals which is advocated in the memorandum could be accomplishe more readily in psychiatry perhaps than a simila interchange in other branches of medicine, for whic it might be an experimental model.

Few will dispute the wisdom of the proposa that a special department within the central healt authority should be set up to administer all branche of mental health—a department which would include many of the present functions of the Board o Control. Whatever the form taken by the propose comprehensive health service for the nation, menta health is too large a matter of public concern to b treated otherwise than as an essential part of th public health services, so organised that a policy o active development can be pursued promptly an with determination. For this, in psychiatry a in other branches, two elements are essential: progressively-minded department or division withi the Ministry of Health, and an energetic and unconstrained advisory committee. These two element —the officials who are more frightened of stagnatio than of making a mistake, and the independen advisers who recognise their responsibility to guid (and occasionally force) progress on sound lines— are equally necessary at all the levels at whic administrative and executive action has to be taken Among the detailed recommendations made by th psychiatrists on this score, not the least importan and significant is the insistence that the executiv medical officer to the mental health authority shoul be a man of senior status with clinical and administrative psychiatric experience. The authors of th memorandum would oppose strongly the view tha the health authority should be wholly guided by it medical officer of health in arriving at decision regarding mental health: "until there has been a radical change for the better in medical education, it will be quite impossible for the development of psychiatry to be undertaken by those without specialised knowledge. If the mental health services of the country were to be directed and administered by those without specialised training the integration of psychiatry into the whole medical structure which we so much desire would be frustrated." The importance of the mental health services warrants that a statutory committee of each local health authority should be created to deal with it.

The memorandum includes a comprehensive table of the coördinated mental health service, from which it can be recognised that psychiatry is not nowadays restricted to mental hospital care and consulting-room psychotherapy. It impinges on many fields, and besides its home in medicine (to one aspect of which the cant epithet "psychosomatic" nowadays draws attention) it has intimate associations with education, the law, and industry.

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[1] The recommendations are printed in full on p. 763.

The reasoned argument set out in the first part of the memorandum deserves study along with the later recommendations. But the main virtue of this univocal [illegible] in its appropriate place alongside the other members of the family of medicine. No doubt psychiatry will gain by the closer kinship, but so will medicine as a whole. Otherwise it will be impossible to get the full benefit from that better education of medical students and doctors in the psychiatric aspects of medicine proposed in the two interim reports of the College of Physicians committee on psychological medicine.

Army Diet in the Tropics

APART from the replacement of salt and water lost through the skin, the chief dietetic problem facing our Far Eastern armies is not so much what the men ought to eat as what they are willing to eat and how to get it to them. RUSH,[1] for instance, found that a group of soldiers in a forward area in the South-west Pacific were losing weight because, though their diet contained over 3000 calories daily, the men were actually eating only enough to supply about 2300 calories—less than the generally accepted allowance for a man doing sedentary work. RUSH suggested three possible explanations for their anorexia—an anxiety state resulting from the threat of enemy bombing; the effect of excessive heat and humidity; ad the men's dislike of some of the processed foods f their rations, of which they had become almost terally sick. Monotony is particularly hard to void in the Far Eastern theatre. In operational reas local resources can seldom contribute materially owards feeding the large additional military populaions. Foodstuffs, perishable and non-perishable, ave to be imported over lines of communication hose length and complexity recall ROMMEL'S escription of desert warfare as the "quartermaster's ightmare." Supplies must first travel by sea or ail, perhaps for hundreds of miles from the main ase, and then by river, or by roads which may raverse mountains where the gradients and corners, hough engineering triumphs, demand stout hearts n the convoy drivers. The fighting front often covers reas where no roads have yet been driven, and ations must then reach the forward troops on mule-ack or even by man-handling. Air transport can course do much to overcome these difficulties, as WINGATE and his Chindits demonstrated, for food can be flown to the front from the main base in as [illegible] road; but even [illegible]ble the feeding or an army by air is rarely practicable, except as a temporary or supplementary measure. Not only the transport but also the storage of foodstuffs in the tropics creates great difficulties. Food must be protected from insects and fungi, and even canned foods, which can be relied on for months or even years in temperate or arctic climates, are much less reliable under tropical conditions, where, unless they are specially protected, moisture in the air soon causes rusting and perforation of tins and makes wooden cases susceptible to attack by rotting fungi. Difficulties of communication in jungle warfare restrict the movements of the main armies to well-defined routes, like river valleys. The opposing forces may be miles apart and contact must be maintained as elsewhere by patrols; but patrols under these conditions may involve an operation of some days and not a few hours as in Western Europe. The feeding of these patrols is yet another of the quartermaster's nightmares. The men of the patrol, moving by tracks through uncultivated jungle, cannot "live on the country"; they must carry their food with them in a form that is resistant to heat and humidity, and above all is light enough to leave the men unencumbered for instant action. Fortunately water is usually more plentiful in tropical than in desert conditions. But every drop must be sterilised before men can be allowed to drink it, and transport difficulties again obtrude, making water rationing sometimes essential, in spite of the obvious theoretical objections. Large-scale feeding in the tropics, then, [illegible] Americans call "logistics [illegible] problems of food preservation, than of dietetics.

Men who are to fight well must be fed well—that is the cardinal principle on which the feeding of British, Imperial, and Allied troops on the Far Eastern fronts has been based. The ration scales laid down, as well as conforming to accepted dietary standards, are more lavish in range than in other theatres of war. Canned and dehydrated foods are included to replace perishable food when these are unobtainable. But canned food no longer means the inevitable "bully beef": a whole range of meat items from steak-and-kidney pudding to 'Spam,' as well as steamed puddings, fruit cake, and the like, may now reach the soldier in Burma in tins. Dehydrated meat and vegetables provide yet other alternatives, which with efficient reconstitution can become highly palatable. All these are useful as a change and a stand-by, but purely processed foods cannot yet entirely take the place of fresh over long periods. Apart from the loss of nutritive value in processing, such a diet quickly becomes monotonous and so gives rise to anorexia and malnutrition. Every effort is therefore made to supply fresh meat, vegetables, and fruit to the fighting fronts. Refrigeration space at the main bases is being increased steadily, and refrigerated transport—sea, river, rail, and road—is being used to distribute frozen or chilled food. Frozen meat is being flown direct from the base refrigeration depots and landed at forward areas for issue direct to the front-line troops. Bad cooking can spoil the best balanced diet, not only by causing excessive loss of nutrients but by making the food so unattractive that men do not eat what is provided for them. Increasing numbers of specially trained catering officers are therefore supervising the soldiers' messing in the Far East, as in other theatres of war. Since it is not always safe to rely on the natural vitamins of the diet, margarine and chocolate are fortified with vitamins A and D, and soon the flour used for the troops will have vitamins of the B group added to it. Supplements of vitamin B_1 and ascorbic acid, which tend to be destroyed by storage at high temperatures, together with riboflavine and nicotinic acid, are provided in compound vitamin tablets that can be issued whenever the medical authorities on the spot think they are required.

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[1] Rush, A. *Bull. US Army med. Dep.* November, 1944, p. 43.

The needs of troops engaged in patrols and other operations where the normal supply of food in bulk is impracticable are being met by two types of compact ration packs. The first is an individual ration for one day, one or more of which the soldier carries in his pack, according to how long he has to be self-supporting. This is made up of items chosen for their high calorie value relative to weight and volume, including high-fat biscuits, and blocks of dehydrated cheese and of dehydrated cooked oatmeal with fat and sugar, as well as tea-sugar-milk powder, which only needs boiling water to produce a cup of tea, and lemon-juice powder with sugar. The day's ration is packed as three meals, each in a very light sealed aluminium container that completely protects the food against moisture, gas, and insect pests, but can be opened easily with a pocket-knife. Although primarily designed for use over short periods, men may have to subsist on this ration for several days, and its vitamin and salt contents are therefore supplemented by a tablet containing the important water-soluble vitamins, and ten-grain tablets of sodium chloride. Two of the salt tablets dissolved in the contents of the soldier's waterbottle make a 0·1% solution, the strength recommended by physiologists and on grounds of palatability. Replacement of salt lost in the sweat by adding salt to the drinking water has the advantage of correlating the soldier's salt intake with his water intake—a necessary precaution; since the requirements of water and salt in a hot climate are interdependent. The soldiers' comfort has not been forgotten in planning this ration, for the packs contain cigarettes and even toilet paper. Each man is also provided with a pocket cooker. The second special ration is a variant of the 14-man composite ration pack, familiar since the landings in North Africa. The Far Eastern version has been designed to supply only 6 men for a day, so as to keep the weight down to a porter's load in case the packs have to be man-handled over long distances. The pack consists of canned foods, and is supplied in seven different menus chosen from items known to be popular with British soldiers. The tins are coated externally with a special camouflage paint, which also protects them against rust and corrosion, and are packed in a wooden case treated with mould-resisting paint. The composite ration pack is intended for group, not individual, feeding, but none of the items require more cooking than standing the tins in boiling water, and at a pinch all can be eaten cold. Men may have to be fed for weeks on these packs, so vitamin and salt tablets are again included. To provide safe drinking-water for men who cannot be supplied from bulk or unit purification apparatus, a filter bag and pocket sterilisation outfit are supplied, for use with the ordinary water-bottle, which will render any source of water potable.

By measures such as these—the antithesis of the living-on-the-country methods that have repeatedly brought disaster to their enemy—the nutritional health of the British soldier and his Imperial comrades in the Far East is being fostered, and we hope assured, in what-r conditions of warfare he may find himself.

Annotations

RMBF

ESSENTIAL work for the profession is done by the Royal Medical Benevolent Fund, which should have the active support of every doctor. The fund is doing well, but could do better if it had the assured income it deserves. A new possibility now being considered is the establishment of a home to take old and disabled people who have nobody to look after them. There are many beneficiaries of the Fund—members of our profession or their dependants—who would rejoice to know that there was a place where they could really be at home and end their days in peace and comfort. Meanwhile the Fund provides whatever help it can offer by grants of money and otherwise. The scope and need of this work are shown once more in the report which will be presented to the annual meeting to be held at 3.30 PM next Wednesday, June 20, at the house of the Medical Society of London, 11, Chandos Street, W1. It is hoped that this year, now that the European war is over, supporters in the neighbourhood will make a point of attending the meeting if they can.

NUTRITION IN NEWFOUNDLAND

FOR over 40 years attention has been repeatedl called to the unsatisfactory nutritional state in Newfoundland, our oldest colony; many studies have bee made and much has already been done to improv matters, but the latest survey,[1] done last August by a highly skilled team at the invitation of the Commissioners for Public Health and Welfare, finds that the health of the 320,000 inhabitants is still far from satisfactory. Poverty, poor fertility of land, remotenes of a large part of the population, and lack of transpor are some of the difficulties the Government has to face *The death-rate varied in 1939–43 from 11·7 to 12·5 pe* 1000. In England and Wales in the same period the rate was 11·6–14. The infant-mortality rate in St John's was 111 per 1000 live births in 1942; in Englan and Wales it was 49. The death-rate from respirator tuberculosis in 1941 was 144 per 100,000; in England and Wales in the same year, 57 per 100,000. The published report says that "stomach ailments" ar common, yet gastric and duodenal ulcers are rare "Renal stone" is common. Tuberculosis is prevalent but nothing is said about the extent of bovine infection and one in three of the people have some fresh cow's milk. No mention is made of the incidence of arteria disease, arthritis or diabetes, and we do not know from what diseases the people suffer or from what they die However, the picture though imperfect is full of interest.

The report, which is based on the inspection of 868 men, women, and children in St. John's and several outposts, shows us a people taking a diet adequate in calorie value (adult average 3039 a day) and adequate in protein (94·4 g.) and fat (75·4 g.). Both children and adults are slow in mental reaction and lacking in initiative, the skin of the children being inelastic, and that of young adults atrophied and wrinkled, subjects of all ages appearing older than their years with poor musculature in all ages and sexes. Yet the children, though generally underweight, are of normal height. The gums were diseased in 62–73% of the people examined and nearly half of the adults had lost all or nearly all their teeth from that cause, edentulous mouths being not uncommon in the early twenties. Widespread dental caries was also noted. The investigators have sought the answer to this imperfect picture in an elaborate survey of a few popular dietetic nutrients. They find many signs of vitamin-A deficiency—xerosis conjunctivæ, follicular changes in the skin, and xerosis of the skin—and say the diet was extremely low in vitamin A (1400 i.u. mostly preformed), but no night-blindness and no corneal changes are reported. Signs of vitamin-C deficiency were common, and the diet is low in ascorbic acid (about 20 mg. a day), but no scurvy was recorded. Judging from the pictures and the text the swollen gums do not bleed easily. The amount of nicotinic acid in the diet was on a level that is considered adequate (14·6 mg. daily) yet "mild, acute, and chronic niacin deficiency was of frequent occurrence in the population examined." Papillary hypertrophy, papillary atrophy, and multiple fissuring, redness, and swelling of the tongue were the signs noted in 63%. No pellagra was seen, though this often manifests itself when infection arises in a population chronically deficient in nicotinic acid. Riboflavine was another vitamin noted as extremely low in the diet (0·80 mg.) and "gross" deficiency lesions were recorded—cheilosis, angular stomatitis, dyssebacia, and 100% with "some degree of corneal vascularity," but we are not told whether this means more than a visible limbic plexus. No severe lesions affecting sight or the central nervous system were seen. Thiamine deficiency (daily intake 0·96 mg.) was reported in 6·8% of the persons examined. Absent knee and ankle jerks, some loss of vibratory sense, tender calf muscles, and positive squatting test, ascribed to lack of thiamine, were fairly common findings. No mention is made of alcohol consumption. In the East even this degree of vitamin deficiencies would be thought sufficient to account for an increased mortality in sucklings, but no remark is made on this aspect of the high infant mortality. Signs of rickets were seen in 2·6% of the population examined, yet in spite of the low calcium intake (0·360 g. daily) no tetany and no symptoms of osteoporosis, such as was observed by Meulengracht and others after long-continued low calcium intakes, were seen. The iron intake was also low (9·96 mg. daily), yet only moderate degrees of anæmia were found in about 24%, and only 5% had hæmoglobins below 11 g. per 100 c.cm., in spite of the low concomitant calcium in the diet. To complete this curious picture, the blood-proteins and serum-phosphatase are recorded as normal.

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[1] Adamson, J. D., Jolliffe, N., Kruse, H. D., Lowry, O. H., Moore, P. E., Platt, B. S., Sebrell, W. H., Tice, J. W., Tisdall, F. F., Wilder, R. M., Zamecnik, R. C. *Canad. med. Ass. J.* 1945, 52, 227.

The investigators find the chief fault in the diet to be a paucity of milk (average intake 5·5 oz. a day), an absence of tomatoes and citrus fruits, and the over-cooking of cabbages and potatoes; but it seems doubtful if this is the whole tale. The data given of annual imports and estimates of food production show that of the 44·5 lb. of meat per capita eaten in a year [illegible]

[illegible] of cod eaten is likewise salted fish. Of the flour eaten 98% is white, and of the fat under 3% is butter and nearly 60% margarine, whether fortified or not is unstated. The history of scurvy and other dietetic deficiencies in these Northern climates is always bound up with the quantity of salt meat and salt fish eaten; perhaps salt meat more often than salt fish. From Lind's observation to this day this remains unexplained, though it has been remarked by many travellers and in many expeditions and is mentioned in nearly every description of dietetic deficiencies in these latitudes, including those in the American Civil War. From these accounts it appears that any diet with the minimum effective allowance of essential nutrients can be made defective by giving enough salt meat, and the symptoms can be made more severe by increasing the flour in the diet. We know that a little rancidity goes a long way to spoil [illegible]

[illegible] changes that are of importance in dietetics? Fishermen and salt-curers have definite preferences in their trade; is this justified from a dietetic point of view or is it only æsthetic? Was Ibsen, a Norwegian, right in his analogy—"like rancid, mouldy ham producing all the moral scurvy that devastates society"? Until we know the answer to these and similar questions, dietetic reform in Newfoundland is likely to be mere patchwork.

PASTEURELLA INFECTIONS IN MAN

PASTEURELLOSIS is a common infection in many animal species. It usually takes the form of an acute hæmorrhagic septicæmia, but a chronic infection—called pseudotuberculosis because of nodules in liver and lungs and enlarged caseous glands—occurs in guineapigs, rats, and cats, while rabbit snuffles is an example of a localised pasteurella infection. Pasteurella organisms are to be found in the upper respiratory tract of such domestic animals as cow, pig, cat, and rabbit; yet it is only within the past year that human infection with *Pasteurella septica* has been recorded in this country, though 2 of the 6 cases quoted by Allott and his colleagues[1] occurred ten years ago. These *Past. septica* infections have usually followed wounds by cat-bites, which are proverbially slow to heal. There is as a rule an immediate œdematous inflammation which soon settles down to a low-grade suppurative process with subacute osteomyelitis as a common complication; regic [illegible] bubonic plague (which likewi [illegible] of and tularæmia, has been [illegible] m) [illegible] some cases. While the cat is the usual culprit, as in the typical case reported by Cooper and Moore in our present issue, 3 of the 6 cases reported by the LCC pathologists followed dog-bites, and it is noteworthy that these were seen within three months in north-west London, which suggests a dog epizoötic of pasteurellosis at that time. These cases are apparently the first recorded instances of human pasteurella infection following dog-bites and they should encourage more careful bacteriological [illegible]

[illegible] may easily be missed in the presence of secondary infecting organisms like *Staph. aureus*. Its main distinguishing features are its failure to grow on MacConkey's medium and its high pathogenicity for laboratory animals, with peritonitis and pericarditis common findings. While infection of animal bites is the usual form of pasteurellosis in man, the organism has been isolated from infected pleural cavities, and Ludlam[2] has lately reported an instance of appendicular abscess due to *Past. septica*, while Robinson[3] records a case of pasteurella septicæmia and septic arthritis in an African native. Thus it seems that these organisms are sometimes inhaled or ingested and may set up infections in different parts of the body.

CASTRATION AS PALLIATIVE IN PROSTATIC CANCER

THE success of castration as a safe remedy for benign enlargement of the prostate is unlikely to be overlooked in these days. Whether prostatic cancer can ever be cured by the same simple means is extremely doubtful, and a final judgment on the matter cannot be reached for several years. Meanwhile, however, enough is known of the effects of castration to establish its value as a palliative. Emmett and Greene,[4] analysing the results of the operation in 117 cases of prostatic cancer treated at the Mayo Clinic during the 2¼ years ending with December, 1943, noted some relief of pain (usually considerable and often complete) in 90%, and found that it persisted for 4–18 months or longer. It is questionable whether similar benefit can be achieved so easily

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1. [illegible] Williams, R., Glass, V. [illegible] th. Bact. 1944, 56, 411.
2. [illegible]
3. [illegible]
4. [illegible] Am 1945, 127, 63.

by any other form of treatment. Although we must not assume that the malignant process can be permanently arrested by removing the testes, we may at least feel sure that it is not accelerated. Emmett and Greene have compared the survival-rates in their series treated by castration with the survival-rates of patients who underwent transurethral resection in the Mayo Clinic between 1924 and 1937, as reported by Thompson[5] as follows :

Treatment	No. of cases	% died during first year	% dead by end of second year
Transurethral resection	326	26·2	50·5
Castration	220	23·	39·4

It might have been supposed that the less malignant forms of prostatic cancer would react to castration more readily than the more malignant. But Emmett and Greene, correlating relief of pain with the grade of malignancy (Broders) in 70 of their cases, find no association.

There do not seem to have been any grave ill effects from castration in the large number of cases reported in the medical journals. The idea that castration has a disastrous effect on the mind—an idea which at the end of last century led to the abandonment of the operation—may now be regarded as extinct : indeed Bumpus, Massey, and Nation[6] call special attention to the striking psychic improvement that has followed castration, with or without the addition of œstrogen therapy, in some of their patients. Such psychic improvement, they say, is not to be explained by the relief of urinary obstruction nor as an effect of œstrogen.

An alternative to castration, preferred by some surgeons in carcinoma of the prostate, is the repeated or continued administration of œstrogen. Probably the improvement from both methods depends mainly on reduction of the supply of androgen which induces activity in prostatic tissue. Although such a reduction is a certainty, administration of œstrogen may also bring into play factors not introduced by castration. Here again we must defer judgment until we can compare large series treated by the two methods.

PLAN FOR AUSTRALIA

It is not only in Britain that plans are being made for new health services. In New Zealand, Australia, and South Africa changes have begun which will shape the future of medical practice. Many of the problems they are in process of solving are ones which we all have in common, and we may well profit by a study of solutions proposed and experience gained outside Britain.

Sir Raphael Cilento, director-general of health and medical services for Queensland, surveys existing medical provision in Australia, summarises the discussions that have taken place, and makes his own personal unofficial suggestions[7]. Believing that "very few programmes for organisation are original" and that "consciously and unconsciously one builds upon foundations long laid by others and forgets the obligation ; absorbs, extends, and modifies ideas drawn from similar or even alien projects, so that at the end a positive mosaic is produced in which every individual idea has merged, losing its identity in the general picture," he has himself studied carefully what has been happening in other countries—particularly in Britain—and he quotes extensively, and with shrewd comment, from ideas and opinions which have appeared in medical journals.

Australia must be a difficult country to plan. Distances are enormous. The population is small in comparison to area, and very unevenly distributed. In the two cities of Sydney and Melbourne live nearly 2½ million people—about a third of the inhabitants of the whole of Australia. Add the four other State capitals, and we have accounted for more than half the population ; while outside these six cities there are only nine towns in the whole continent that can boast of a population of 30,000. It is not then surprising to find that there has been a tendency for medical men to congregate in the cities, and for the small townships and the "outback" to be starved of medical, nursing, and hospital care.

Cilento does not believe that this situation can be overcome, and an equitable and universally available medical service provided, by competitive private practice. He thinks that in the outpost areas it will be necessary to provide a salaried service of general practitioners, who must be given better access to hospital and specialist services—where necessary by the wider provision of wireless communications and air transport, which have already amply proved their value in the remote districts. Even more than in our own Highlands and Islands, the high expense of caring for a sparse and scattered population makes private practice economically impossible. For the small townships (and in the cities as well) Cilento recommends the establishment of health centres. He has in mind, however, much larger centres than are generally advocated in this country. He favours a centre which will at the same time provide consulting-rooms for the local practitioners and be a consultative clinic for visiting specialists. These centres, he thinks, should each serve a population varying from 15,000 (in rural townships and their environs) to 50,000 (in a city suburb). They should be responsible for all general-practitioner, public-health, and preventive medical services. The optimal centre would serve 30,000 people and employ 15 to 20 general practitioners. The practitioners would be encouraged to undertake graded specialist work wherever possible, and would take a full part in the work of the local hospital. A visiting consultative specialist squad, based upon a larger regional hospital, would attend at fixed times at each of the health centres in its region.

As Cilento enlarges on his plans he finds it necessary to discuss in turn all the problems that have been before us here—of administration (which for him is more complicated even than for us, since he has to allow for State governments as well as for the central federal government), of the desirability of a corporate body, of medical representation on council and committee, of methods of remuneration, and of pensions, holidays, and postgraduate study. To all he brings understanding, and an ability to weigh the pros and cons of any suggested policy. Some of his conclusions are applicable only to Australia ; some others run counter to present majority opinion here ; but all are so ably and fairly argued as to repay careful study.

In the Dissolution honours a viscounty was conferred on Lord Addison, MD, FRCS, leader of the Labour Party in the House of Lords since 1940.

On May 29 at a special meeting of the fellows of the Royal Society of Medicine the following were admitted to the honorary fellowship : Sir Sheldon Dudley, FRS, Sir Alexander Hood, and Sir Harold Whittingham (directors-general of the medical services of the Royal Navy, the Army, and the Royal Air Force), Sir Francis Fraser (director-general of the Emergency Medical Service), and Colonel V. L. Gallemaerts. Colonel-General Smirnov, Dr. Karl Evang, and Colonel Frantisek Langer (representatives of the medical services of Belgium, the Soviet Union, Norway, and Czechoslovakia). It was also announced at the meeting that the gold medal of the society for 1944–45 had been awarded to Brigadier Sir Lionel Whitby.

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[5] Thompson, G. J. *Ibid*, 1942, 120, 1105.
[6] Bumpus, H. C., Massey, B. D., Nation, E. F. *Ibid*, 1945, 127, 67.
[7] Blueprint for the Health of a Nation. Sir Raphael Cilento, MD, DTM&H, barrister-at-law. Sydney : Scotow Press. P. 196.

Special Articles

THE PSYCHIATRIC SERVICES

JOINT RECOMMENDATIONS

THE Royal College of Physicians, the British Medical Association group of practitioners of psychological medicine, and the Royal Medico-Psychological Association have published a memorandum[1] on the organisation of psychiatric services in a National Health Service. This report, which is discussed in a leading article, ends with the following recommendations:

SCOPE OF PSYCHIATRY

1. Psychiatry is not a limited specialty. It permeates and influences general medicine, surgery, and

of all medical work which is essentially psychiatric. This will necessitate certain legal changes.

3. The psychiatrist is not concerned only with fully developed mental disorders. The mental health service should include provision for prophylaxis of mental disorder over the widest field.

4. In the educational sphere psychiatric advice is essential for children showing neurosis, behaviour disorder, or mental defect.

5. In industry a full and efficient consultative psychiatric service should be available, which should work in close coöperation with the patient's doctor and the industrial medical officer. Psychiatrists should cooperate with industrial psychologists in the investiga-
and ill health, working hours

vocational guidance and
which is the assessment

7. Psychiatrists shoul
of patients after accident or illness. This work should be carried out in close liaison with employers, workers' representatives, and patients' doctors, and any necessary adjustment should be made in the patient's employment on his return to work.

8. There are many other fields in which the psychiatrist should play his part, such as sociological investigations and education in sexual matters.

ADMINISTRATION AND STAFFING

9. The main factors which retard progress in the treatment of mental disorder at the present time are (*a*) the law, which lags behind enlightened public and medical opinion; (*b*) the mental hospital buildings, many of which are quite out of date, having been designed for detention and safety, without sufficient vision regarding curative treatment; (*c*) the association of public assistance with mental hospital treatment; and (*d*) the numerical inadequacy of the medical staff and the numerical and professional inadequacy of the nursing staff in mental hospitals. Improvement is necessary also in the status, pay, and conditions of service of the medica
gard to professional
edical committees.
inical work should be developed.

ed a mental health authority
powers in each area through-
be decided hereafter by the
ity to be responsible for all
spects of mental health—i.e., to take over the work of ommittees of visitors, the committees under the Mental Deficiency Acts, and child psychiatry (including child uidance). Mental health authorities should consist f elected and coöpted members. Close cooperation hould be maintained between these authorities and the ublic health and education committees and those esponsible for the voluntary hospitals.

11. On any local advisory bodies, such as the local health services council, there should be adequate psychiatric representation. No doubt such councils will appoint special mental health subcommittees with power to coopt.

12. Large areas are preferable to small areas. Each area should be of sufficient size to warrant the setting up of a complete mental health service.

13. All matters appertaining to mental health administration should be removed from public assistance.

iatric department
leal with and ad-
this arrangement
should be reproduced for administrative purposes throughout the local organisation. In the past the Board of Control has provided a separate organisation for coordinating mental health matters. The work of the new central department now suggested would include in general the present functions of the Board of Control, especially in so far as it will be necessary indefinitely to keep a watching eye on the legal aspects of psychiatry. Whilst the head of this department should be a psychiatrist, there will have to be also legal members of the staff, for reasons similar to those which will no doubt operate in other branches of medicine in which forensic problems frequently arise.

15. A special medical officer should be appointed in each area as adviser and executive officer to the mental health authority of
branches of mental he
senior status with clinic
experience. He should have reasonable security of tenure.

16. Unless and until the mental hospitals and mental deficiency institutions are organised on the same lines as the voluntary hospitals there should be a medical superintendent in charge of each hospital who should be in continual touch with the clinical aspects of the hospital and its patients. The position which imposes complete legal responsibility on medical superintendents for all patients in the institution under their care should be reviewed.

17. In each hospital there should be a medical committee composed of members of the staff, including visiting com-
mittee o should
be transı mally
through the medical superintendent who should have a duty to convey them.

18. The facilities for outpatient treatment of adult mental illness require much extension. Clinics should be available in every part of the country. Most cases of psychoneuroses can be treated in well-organised outpatient clinics.

19. Observation wards should be upgraded into early treatment units, which should be departments of, or readily accessible to, general hospitals, voluntary or municipal.

20. There are a number of cases of psychoneurosis which need more intensive treatment and/or closer supervision than can be arranged at a general hospital. For these, special hospitals should be provided under psychiatric direction, with nursing staff of special training and experience. For chronic psychoneurotics provision should be made in special hostels, not in the psychiatric wards of general hospitals.

21. It is essential for the proper understanding of all cases, including those of somatic disease, for medical students to be taught a suitable psychology in the intermediate stage as well as the principles of psychological medicine in the final course. At least one question on psychological medicine should be asked in the general medicine examination. Clinical psychiatry should form a definite part of the clinical examination. Teaching and examining bodies should be urged to raise the standard in clinical experience of psychiatry to the level of the kindred subjects of medicine, surgery, obstetrics and gynæcology.[2]

22. There should be a coördinated system of psychiatric social service. All psychiatric social workers should receive such training as will fit them for service in all branches of the specialty. They should take an active

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[1] The Future Organisation of the Psychiatric Services. Obtainable from the secretaries of the three contributing bodies.

[2] See first interim report of the Royal College of Physicians psychological medicine committee.

part in adjusting environmental difficulties, especially in relation to industry and education.

23. Non-medical psychologists should be employed more extensively and should work in the closest possible cooperation with psychiatrists, but they should not carry out psychotherapy.

24. Facilities for adequate grading should form a basic principle in future administrative arrangements for the treatment of psychiatric patients of all types (including mental defectives) bearing in mind the disadvantages that may accrue from the segregation of chronic patients, except possibly for senile cases, in a separate institution. Patients certifiable under the Mental Deficiency Acts should not be admitted to mental hospitals unless there are overriding psychotic symptoms.

25. The patient should be enabled to use the financial benefits to which he is entitled under insurance legislation, in order to supplement his private means so that he can obtain the treatment of his choice.

26. The status of mental nursing should be equal to that of general nursing. All general nurses should receive some training in psychiatric nursing.

PSYCHOSES AND PSYCHONEUROSES

27. Dependent on the area and density of the population to be served, mental health services other than those provided by the general practitioner should be supplied by means of the mental hospital and psychiatric units. That part of a general hospital, whether in- or outpatient department, which is set aside for the treatment of mental disorders, with or without any legal formality, should be known as a psychiatric unit.

28. An adequate number, generally 5%, of beds should be available in general hospitals where a psychiatric outpatient clinic is held regularly, provided that the hospital makes adequate provision for suitable nursing.

29. In larger centres (especially university towns) special psychiatric units should be established, with facilities for both outpatient and inpatient treatment, teaching and research. The immediate establishment of such units is urged as being eminently practicable.

30. The mental hospital will continue to be the main unit for the provision of inpatient services and must be maintained at the maximum efficiency in staff and equipment. Both the medical and nursing staffs should be materially increased, in some cases by 100%, over the low pre-war standards. Adequate laboratory and other services should be available and liaison should be maintained with general hospital services. All the members of the appointed medical staff should take some part in extramural duties—e.g., outpatient, convalescent (rehabilitation) homes, and in a consultative capacity at health centres. There should be posts for house-physicians at all mental hospitals. These should be taken up after the usual house-officer appointments have been held in a general hospital. Some experience in general practice is a valuable preliminary to training in psychiatry.

31. All suitable existing hospitals, such as registered hospitals, licensed houses and, in Scotland, the Royal Mental Hospitals, should continue to be used either for patients under the National Health Scheme or for private patients, and advantage should be taken of all material for teaching and research.

32. The amendment of the Mental Treatment Act (1930) is urged so that under section 5 all non-voluntary admissions may be received for the purpose of treatment and detained for a period not exceeding 6 months, with possible extension by the department of mental health, without a reception order. This involves the omission of all reference to "willing or unwilling to receive such treatment."

33. While it is desirable that the great majority of psychoneurotics should not be treated in mental hospitals a certain number may be admitted, dependent on the degree of disorder and abnormality of behaviour and the sensitiveness of the patients to their surroundings. With due regard to the foregoing, this would entail that the mental hospitals should be so reorganised as to provide suitable facilities for inpatient treatment for all types and degrees of mental ill health, including neuroses, by the provision of suitable separate units (where [illegible]ary of new units) to guarantee adequate grading. This would also involve appropriate training of medical and nursing staff.

34. Legislation and accommodation are required so that drug and alcohol addicts and other antisocial psychopaths may be detained under some form of order for periods sufficient to permit of adequate treatment.

MENTAL SUBNORMALITY, INCLUDING MENTAL DEFICIENCY

35. It should be recognised that mental subnormality and its social consequences undoubtedly provide a very wide problem.

36. The present legal and administrative procedures need revision:

(a) To remove the existing confusion and anomalies whereby defective children are dealt with in several different ways under 4 different authorities.

(b) To remove the difficulties of bringing under suitable care and training children who are first seen between the ages of 14 and 16.

(c) To enable any subnormal child to receive without strict formality or legal certification such special education as may be necessary (now likely to be provided under the Education Act).

(d) To provide for the whole group of the subnormal rather than for the restricted portion who are certifiably defective.

(e) To provide that a certified institution may, when advisable, admit patients on a "voluntary" basis on the application of a relative and one medical recommendation as in section 1 of the Mental Treatment Act, 1930, and also in conformity with section 5 of this Act on a temporary basis.

37. The medical adviser to the mental health authority if not sufficiently experienced in mental subnormality, should be advised by a recognised specialist in this field.

38. The entire service of the subnormal should be transferred from the public assistance authorities to the mental health authority.

39. For the retarded group an increased number of special schools, both residential and day, is required. More occupation centres should be established.

40. Mental deficiency institutions should be on the colony plan. Each should accommodate a cross-section of the mentally defective population and none should be reserved for low-grade defectives.

41. The community care of the retarded class and licence from institutions should be widely extended. All large institutions should have several branches, both for use as hostels and for training.

42. In each area there should be provision for a period of observation by temporary residence in a special unit, or in an existing institution, before actual certification in the case of a high-grade defective. Admission to such units should be on a "voluntary" basis in the case of minors or on the order of a magistrate or other official approved for the purpose by the department of mental health, and should be for a period not exceeding 6 months. Special experience and qualifications should be possessed by at least one of the practitioners who certifies the fact of mental deficiency in any case.

43. All doctors employed in mental deficiency colonies or institutions should have opportunities for extramural duties in order to provide the essential specialist advice in schools, clinics, and hospitals, and to maintain and promote their own general efficiency by a wider range of medical practice.

44. The ascertainment of mental deficiency should be entrusted to psychiatrists with appropriate experience.

45. It is desirable that a psychiatrist should be appointed to every education authority and in all cases there should be close cooperation between general practitioners, and medical officers and psychiatrists working in the field of mental deficiency so that consultations may take place, whenever necessary, in regard to educability of particular children and the ascertainment of defect.

CHILD PSYCHIATRY

46. Since prevention is the most important part of the work of the future health service a child psychiatry service must be an integral part of any adequate mental health services. Child-guidance clinics, with associated inpatient facilities, are required in every area; and should be under the management of the mental health committee working in close cooperation with education authorities.

47. As an important prophylactic measure there should [illegible] school [illegible] ly the [illegible] all cases showing emotional instability or serious intellectual subnormality should be referred for full psychiatric examination.

48. Residential school treatment under psychiatric direction should be made available for maladjusted children, preferably by voluntary admission.

DELINQUENCY

49. Psychiatric advice should be made more widely available to the courts so that greater use of it could be made by them. There should be collaboration with the legal authorities at all stages in the ascertainment, treatment, and rehabilitation of offenders.

50. A mental health service should cover at least the psychiatric requirements envisaged in the Criminal Justice Bill of 1939, and the powers of the central health authority should include at least the provision of psychiatric advice to approved schools, Borstal institutions, remand homes, and the special hospitals proposed in the Criminal Justice Bill.

51. Inpatient facilities, of the colony and hostel types, are urgently needed for delinquents, and outpatient facilities require expansion in all parts of the country.

MEDICINE AND THE LAW

Functions of a Medical Referee

[illegible] nal Meter Co. and Gibson, [illegible] light on the functions of a [illegible] der the Workmen's Com- [illegible] Mrs. Smith complained of libels contained in letters emanating from the company which had employed her. Statements made in the course of proceedings before a court of justice, whether by judge, counsel, or witnesses, are absolutely privileged and immune from any liability in an action for damages for libel or slander. The principle has been extended to other authorised inquiries before a tribunal which is not a court of justice but which has similar attributes—e.g., a military court of inquiry. Ought it to be applied to proceedings before a medical referee?

Mr. Justice Uthwatt answered this question in the negative. The medical referee's decision, he said, certainly affects legal rights, but that is not the test. He has to determine several facts which, apart from statutory provision, would be decided by the court on evidence. "In ascertaining facts he is not bound by the strict rules of evidence; he has to do his best on the materials before him. In determining some of the facts his medical skill and kno [illegible] small part; but these ar [illegible] matters, not the substance [illegible] referee. Essentially he is [illegible] his own professional judgm [illegible] proceedings before him, each party submits a statement, and neither side sees th [illegible] opponent. This procedu [illegible] of a judicial proceeding. [illegible] to statements made in [illegible] public policy. "Public policy, so far from requiring that absolute privilege should attach to voluntary statements made [in the proceedings before a medical referee], seems to me to demand the contrary." There is a qualified privilege for such statements, and thus an honest statement is protected. "That protection is all that is required for the full and proper exercise of the functions committed to the medical referee; the protection given by absolute privilege would be a hindrance, not a help." The learned judge held that the statements about Mrs. Smith, though entitled to qualified privilege, were made with malice which cancelled the qualified privilege.

A brief account of the facts of the case may explain the application of the principle. The plaintiff, a munition worker, had her hands from time to time in contact with oil. Owing to their condition she consulted a doctor who sent her to Dr. L. Forman, dermatologist to Guy's Hospital. He certified that she was suffering from dermatitis and was unable to follow her employment. The certificate was sent to the works manager; [illegible] ed that the [illegible] l irritant. [illegible] that he [illegible] a grubby [illegible] f personal [illegible] e "exam- [illegible] "dermatitis produced by dust or liquids," a disease to which the Act applies. She recovered and went back to work, but in the following month there was a fresh attack and she left her employment and claimed compensation. Later the works manager sent a memorandum to the secretary of the company, to be sent on to the company's insurers. It contained allegations that Mrs. Smith had never personally notified the company that she had dermatit [illegible] herself with a lotion. [illegible] have made no effort to [illegible] as she still used the washing and drying facilities w [illegible] The memorandum went on to [illegible] Guy's Hospital stated that he [illegible] was chiefly due to Mrs. Smith's [illegible] that personal cleanliness was pa [illegible] had, after three days' abs [illegible] and she probably [illegible] coming to us."

This communication the judge described, for reasons which he detailed, as "obviously indefensible." The statements were incorrect and he was unable to accept the evidence of the works manager that, at the time he wrote the memorandum, he believed that Dr. Forman had in fact made the statements which it attributed to [illegible] ed the imputation that [illegible] man of uncleanly habits [illegible] r her skin trouble, and that she, with knowledge of her complaint, was quite willing to expose her fellow-workers unnecessarily to the risk of infection. The judge ruled that the memorandum was in law capable of being defamatory and was in fact defamatory. Qualified privilege attached to the occasion on which the works manager wrote to the secretary of the company and to the occasion when the company secretary sent a copy to the insurers. But there was ample evidence of malice; the malice cancelled the qualified privilege; for each of these two libels the court awarded 20 guineas damages.

There was a third communication, written by the company's insurers to the medical practitioner to whom it was understood that the county court registrar had referred the dispute. The letter substantially repeated the statements made in the works manager's memorandum. Mr. Justice Uthwatt held that this doctor's appointment as a medical referee was a nullity because there had been no application in writing accompanied by the prescribed documents. He held that the insurers had written as the agents of the company, that there was malice on the company's part, and that, if a medical referee had in fact been duly appoin [illegible] e was not [illegible] unal exer- [illegible] e privilege [illegible] e parties. [illegible] guineas damages.

TUBERCULOSIS EDUCATIONAL INSTITUTE.—The National Association for the Prevention of Tuberculosis and the Joint Tuberculosis Council have formed an educational institute to be managed by a committee with the following members: Dr. Frederick Heaf (chairman), Prof. W. H. Tytler, Dr. A. S. Hall, Dr. Andrew Morland, Dr. J. C. Simpson, Dr. Norman Smith, Dr. D. P. Sutherland, and Dr. R. A. Young. The functions of the new body will be:

[illegible] for the education [illegible] in tuberculosis. [illegible] connected with education in tuberculosis.

To recommend candidates for NAPT scholarships to assist doctors, almoners, nurses, and social workers to [illegible]

To suggest [illegible]

To issue a [illegible]

To facilitate [illegible] by visit [illegible]

The secretary of the institute will be the secretary-general of the NAPT, Dr. Harley Williams, who has been placed at the service of the joint committee for education.

In England Now

A Running Commentary by Peripatetic Correspondents

WE celebrated the surrender of the German Armies opposing 21st Army Group on May 5 in the SS Panzer Grenadiers' officers' mess in Belsen Camp with some "liberated wine." Afterwards feelings were liberated and an incredible Polish brass band arrived suddenly outside and began to blow away furiously. Some of the bandsmen didn't find the right notes of one tune till the next had begun, but they played away to our cheers and applause—first some Central European marches, then *God Save the King*, majestically thin, and the Polish National Anthem, and then of all things *Roll Out the Barrel*. They were tickled to death when we burst forth into song, so played it through three times and went away with much clicking of heels and hand waves. It makes one feel that the job of cleaning out this human cesspit is really producing results when one sees the expressions of illimitable gratitude.

In the first week of April the British Red Cross were appealed to by 21st Army Group to supply medical attention and correct diet for the thousands of Dutch people who were starving on account of the railway strike. The Red Cross could not cope with the situation by themselves, so they asked for 100 students in their final 18 months from the London medical schools. I was lucky enough to be one of the chosen. But the whole scheme was altered when Holland was liberated so slowly; we waited and waited until suddenly at 3 hours' notice we were told to prepare to be off to Belsen. We had previously been equipped with ordinary Army battle-dress, &c. and started having our inoculations. There was a couple of days' delay because of bad weather, but finally we took off in our Dakotas, with our predigested protein and glucose-vitamin preparations, on May 1. We got to our superb billets the same night—the SS Panzer Grenadiers' training barracks, a super-modern Sandhurst with electric light and running water in each room, even table lamps beside the beds. We go to Belsen Camp every day of the week and work from 8 AM till 6 PM with 1¼ hours' break for lunch. I feel dead at the end of it. That is not the end though, for we have a conference from 6.15–7.15 PM to check up on the chaos here. There is then a council from about 9.30 onwards for group leaders and various officials that have been appointed. We are run by two doctors, one in UNRRA and the other a Czech in the RAMC, a veritable firebrand who has worked miracles and speaks 7 languages. The internees live in long rickety wooden huts about 30 yards long and 10 yards broad. In each hut there were anything up to 500 people at one time, sometimes sleeping in crude three-tier wooden bunks but more often huddled together on the floor. Each of us medical students is in charge of a hut and it is his job to see that the inmates are properly fed; hence the big supplies of glucose-vitamin mixture and predigested milk protein we brought with us. I have a women's hut in which there were 160 people badly ill when we came, almost all with starvation diarrhœa. On the average 4 die every day and their bodies are removed and buried by the Wehrmacht. Death and evacuation to two hospitals which have been set up have now reduced the number to 115. The stench of their filthy emaciated bodies has long ceased to bother me, and the women themselves have long ceased to have any sense of feminine decency or modesty. Each hut is run by a man or woman called the block fuehrer, whose job it is to instil some form of order and keep a tally of the inmates. He or she is usually well fed and in moderately good health. Many of them used to work and so had extra rations. They are usually quite young. My block fuehrer is a Greek girl of 21 who speaks excellent French; and thank odness for that—otherwise the chaos would have far greater, since 95% of the hut speak only Polish. however fast getting a command of the necessary r and now and again raise an odd word in Russian, h, Polish, or Hungarian!

The RAMC, and the RA regiment who liberated elsen, have worked miracles. The latter are doing all e catering for these thousands of people, and suddenly change one's occupation from firing a field-gun o ning six huge kitchens is a feat to be proud of. Of course, there is no science or medicine attached to our job at the moment. Scientific treatment in a human cesspit is impossible, but it will come in time—indeed, it has already come in our two hospital blocks. But it is extraordinarily interesting from the physiological point of view to watch the reactions of starving people to different kinds of food, and I don't suppose we shall ever see famine œdema again. I should have mentioned, though, that the whole thing is complicated by the fact that most of the starved have either typhus or tuberculosis as well.

* * *

Have you ever ridden a tandem bicycle? If so you will have some idea of the feeling in the back seat of a "flying jeep." You will have an intimacy with the ground below that seems to be missing in larger aircraft. When a tree stands in the way, you cannot see what the pilot does but you will go over it or round it according to his whim. If you are travelling in company with another, the pilots will nudge each other with their wing-tips as playfully as two wheelers on the Brighton road. Navigation seems to depend, not on mysterious instruments, but on landmarks visible to any groundsman. It is, in short, the aeroplane of choice for such an essentially terrestrial mammal as myself.

I have no idea how many lives have been saved by these machines. They can take but one casualty at a time, but they can load a man, fly him fifty miles, unload, and be back at the forward airstrip within about an hour. They can take-off and land on 200 yards of roughly levelled paddy field. They are economical of personnel, for one man is pilot, navigator, and all. And what good chaps those pilots are! The ones whom I met were all, I think, NCOs; they were certainly a mixed lot of Americans and English. But which was which I never knew, for they wore each others' uniforms—if they wore anything more than a pair of shorts. They fly out men who are going on compassionate leave; they fly in consultant surgeons; but everyone seemed to agree that the job which they liked was flying out the wounded, Indian, British, or African. I suppose they would say that that was what they were there for.

One morning I flew in from the CCS to visit a main dressing station. The Arakan is a very beautiful place, as seen from the air and in the dry season: a series of Caps d'Antibes without a hotel. I should not wonder if, in my lifetime, it is as easy to reach and even more "developed." Neither pilot nor I knew this strip; but we found it, looking like a solitary pale grey pool among unending miles of green jungle. We side-slipped between two trees (to my great terror) and bumped to a stop. The first person I met was the ADMS, welcoming and cheerful. More old friends appeared from all sides. We watched the surgeon operating in what would be called, as a stage set, "a leafy bower." We lunched more than adequately with the field ambulance; in spite of a long march and a noisy artillery barrage, the CO, a most learned ornithologist, was chiefly excited over the taking of two parrot's eggs. (I hope he does not read this for they may have been parrakeet's). When we got back to the MDS some more serious casualties were arriving. One man with a "compound femur" was badly burnt. The ADMS, still a surgeon at heart, dressed and splinted him, and within a few minutes he was being carried to the flying jeep. A stretcher-case does not occupy the back seat of the tandem; his position rather resembles a seat on the carrier facing backwards, but it is secure, and as comfortable as any ambulance on the road. The door was shut and the machine soared away between those two trees. When I got back to the CCS that night I learnt that the man was on the operating table within sixty minutes of being wounded. Fifty miles may not be far in modern warfare but it makes a lot of difference in saving life and limb. But in this case I am afraid the man died.

* * *

Young Bermondsey sniffed the dewy morning air for the first time and compared it unfavourably with that of Paradise Walk. It seemed to him to lack the amenity smells of fried fish, bakery, and decaying greengrocery, and above all that friendly game-inducing tang of gutters. It was the first morning in camp and a vast world lay before his slightly contemptuous eyes—to

Continued at foot of opposite page

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

THE dissolution of Parliament has involved a massacre of the innocents and few of the measures before the House have been able to get through in the short time available who have escaped he Family Allowanc as it stands except for clauses 13 and 14 which have been redrafted. In the last week of Parliament's life, which will have passed by the time these words appear in print, time will be found for a debate on the health of the nation. We shall no doubt learn a good deal of the different parties' intentions but there cannot be legislative commitments because there is not sufficient Parliamentary time left for the passing of the necessary stages. And it is what is embodied in clauses and sections that counts and not the good, or even the bad, sentiments that may be expressed.

In the penultimate week there were two opportunities for expressing opinion on housing. The Housing (Temporary Accommodation) Bill authorises the erection of temporary houses in the fringes of parks and other open spaces for a period of 10 years. This cuts into

on the Uthwatt plan had been implemented this raid on public open spaces would not have been required.

It would be unkind to suggest that the nearness of the election is the only reason why Mr. Duncan Sandys was able to announce what ma

ary houses were announced by the Minister of Works in a general debate on housing, plus plans to get 100,000 permanent houses going by next year, and to release at once building workers now employed in munition factories.

The dissolution honours have given us two new Companions of Honour, Mr. Arthur Greenwood and Mr. C. R. Attlee, and Lord Addison has become a viscount. The honours led to a flood of congratulations and friendly smiles. Indeed it is really difficult sometimes for the member on one side to remember that the man opposite is a villain.

FROM THE PRESS GALLERY

Sites and Houses

IN view of the big change in the housing situation since the last debate in the Commons in March there was a position, and a discussion ion had been taken on the Uthwatt and earlier reports on the use of land, he complained, and a real solution of the housing problem had thus been postponed for at least a decade. Mr. D. SANDYS, Minister of Works, in his reply said that up to date about 1000 temporary houses had been completed; erection had started on about 2500; sets of components for about 5000 had been delivered from the factories; foundation slabs and drains on sites for 12000 houses were in course of construction. Sets of components of the Uni-seco type were coming off production in a steady flow at a rate of between 800 and 1000 a month. The production of the Tarran and Arcon types had started, and should build up to a rate taken together of about 3000 a month by the autumn. The first few American houses had already arrived, and he

ment traditional building with a programme of permanent prefabricated houses, and development was being pressed forward on a dozen promising systems. Small-scale deliveries of one type would begin next month. It was hoped that the permanent two-story pressed-steel house could be in production by the middle of next year. The present Government stood by the programme of house-building announced by the Coalition Administration—a long-term programme for building 3–4 million houses in ten to twelve years, and a short-term programme with a minimum of 500,000 new houses built or building within two years of the end of the war with Germany. Of these at least 300,000 were to be permanent, and of the remainder at least 145,000 would be temporary bungalows.

Speaking later Mr. H. WILLINK, Minister of Health, said that the programme for the next two years must include provision for the repair and rebuilding of houses either totally destroyed or so damaged as to be useless and which were entitled to a cost-of-works payment under the War Damage Acts. It was proposed that in the first period priority should be given only to houses the rateable value of which in 1939 did not exceed in London £100, and elsewhere £75. At the moment housing authorities owned permanent houses and were of sites for an additional 300, houses were already fully developed. As to temporary houses, 119,000 had been allocated in England and Wales. Between 10,000 and 12,000 sites were being approved every month, and there was every reason to believe that the total number of sites for temporary houses would be approved by July and acquired by December.

QUESTION TIME

Local Doctors and the Treatment of School-children

Mr. S. STOREY asked the Minister of Education whether he is aware of the difficulty likely to be experienced by local education authorities owing to the shortage of doctors and nurses in carrying out the duties imposed on them by section 48(3) of the Education Act 1944 in regard to medical treatment of school-children; and what steps he proposes to take to prevent authorities from throwing further burdens upon the depleted medical personnel of the country.—Mr. RICHARD LAW replied: In circular 29 authorities have been asked to extend their arrangements with hospitals so as to secure free hospital treatment for all children attending maintained schools, so far as accommodation and staffing conditions permit. They have also been asked, subject to the same limitation, to develop, so far as they can, those clinic services which have always been recognised as appropriate to the school medical service. I have no doubt that the needs of urban areas generally will be adequately met in this way. The position in rural areas is more difficult and the circular suggested that in addition to extended use of hospitals authorities should arrange for the treatment of children where necessary by local general practitioners. I recognise that such arrangements can only be made on a limited scale in view of the pressure under which doctors are already working, but I hope that here and there doctors will be found who are willing to undertake this work in a part-time capacity.

During the debate on the third reading of the Education Bill the Minister gave an assurance that the school medical

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Continued from previous page

exploit, to loot, and to conquer. I am not a Lamarckian. I do not believe that acquired habits are inherited as such, but I do believe that the gene complex that can utilise them is. But that takes time.

Coming back laden from a foray on the cockles a fortnight later young Bermondsey suddenly stopped in his stride. His nose went up, his eyes widened, closed and widened again, getting the direction of the wind with his conjunctivæ, his head jerking back the while, then he emitted a long appreciative "Gawd." It was the smell that had steered a thousand generations of his fathers to the haven and the home, the smell that was associated with those departments of his brain that dealt with women and cooking and security, the smell with the message "*Welcome*"—the soul-stirring smell of wood smoke.

service should not be inconsistent with or duplicate provision to be made by the national health service of the future. "The latter service is not yet in being and this, together with the growing medical man-power difficulties, has made it difficult to lay down lines of development for the school medical service for the immediate future. I mean, however, to fulfil the pledge my predecessor gave and, while encouraging urgent developments in those clinic and hospital services which have always been the mainstay of the school medical treatment service, I shall not, for example, approve any proposals which would lead to the setting up by local education authorities of a general medical practitioner service."

Tuberculous Soldiers

Mr. H. McNeil asked the Secretary of State for War if he was now in a position to arrange that men suffering from tuberculosis would remain within the Service while being treated.—Sir James Grigg replied: It has been decided that tuberculosis cases may continue on Service emoluments for eight months, where men are receiving treatment in civilian or military hospitals.

Allowances for the Tuberculous

Mr. F. Messer asked the Minister of Health the nature of the recommendations from his advisory committee on tuberculosis as to the exclusion of chronic cases of pulmonary tuberculosis from the scheme of financial allowances under memorandum 266/T; and what action he proposed to take thereon.—Mr. Willink replied: My Standing Advisory Committee on Tuberculosis in September, 1943, urged a modification of the instruction to tuberculosis authorities that the allowances were not payable in cases where treatment cannot do more than alleviate a chronic condition. It has not been possible to accept this recommendation because these allowances have been paid under emergency powers with the object of restoring the capacity for work of persons suffering from tuberculosis. Allowances could not be paid in chronic cases under these powers, but provision for disability, including that arising from tuberculosis and without the limitation in question, forms part of the proposed National Insurance scheme.

Mr. Messer: Is the Minister aware that the National Association for the Prevention of Tuberculosis, the Tuberculosis Association, and all those bodies actively engaged in this work believe that his scheme is weakened by its limitations?—Mr. Willink: That, apart from committing myself to all these associations, I know is the opinion of many competent folk, but I have explained that there was no legislation which enabled this to be done. All that could be done under the Emergency Powers was done, and we hope to do better under the National Health Insurance scheme.

Artificial Limbs Advisory Committee

Replying to a question Sir W. Womersley announced that the constitution of this committee was as follows:

Sir Charles Darwin, FRS (chairman).
Dr. A. W. J. Craft.
Lieut.-Colonel A. L. Eyre-Brook, FRCS.
Mr. E. Ramsay Green, MI MECH E.
Prof. T. P. McMurray, FRCSE.
Mr. D. P. B. Merriam.
Mr. George Perkins, FRCS.
Sir Rowland Smith, MI MECH E.
Mr. K. S. Watt (secretary).

Administration of Analgesics by Midwives

Dr. E. Summerskill asked the Minister of Health what proportion of local authorities were training their midwives to administer gas-and-air analgesia; and how this compared with the number before the war.—Mr. Willink replied: Out of 188 local supervising authorities in England and Wales, 101 had made arrangements before Dec. 31, 1943, for the instruction of their midwives in the administration of analgesics in childbirth. The corresponding figure in the 1938 returns was 30, but there is reason to think that this was an under-statement.—Dr. Summerskill: While the Minister's reply is encouraging, will he consider taking steps to make this obligatory instead of permissive?—Mr. Willink: I am quite prepared to look into that. With the present great shortage of midwives it is difficult to spare them for additional training.

Expectant Mothers in Indian Mines

Dr. Summerskill asked the Secretary of State for India how many expectant mothers working in the mines in India had been prematurely confined in the mines, and in their homes or hospital, respectively; and how many of these mothers and babies had died.—Mr. L. C. Amery replied: There is no record of any child being born underground. In April last the Indian Legislature amended the existing law to make it illegal for women to work underground in the mines for 10 weeks before and 6 months after confinement, while the hours of work are severely limited for a further three months. The rates of benefit during these periods of absence have been increased.

Dr. Summerskill: How long does the Government propos to sanction this cold-blooded cruelty to expectant mothers?—Mr. Amery: It is not a question of sanctioning. The Government of India are dealing with an extremely difficult situatio affecting the war position and life in India. Machinery is i process of being ordered or installed which I hope will ease th situation, and bring the desired change nearer. Replyin to further questions, Mr. Amery said that the Government o India were as anxious as members of the House of Common to terminate the employment of women in this way. Th wages paid to women while they were prohibited from goin down the pit now amounted to 6 rupees a week for ten week before and six weeks after delivery.

Demobilisation of RAF Doctors

Mr. F. G. Bowles asked the Secretary of State for Ai whether he would give an assurance that doctors, medica orderlies, and other medical staffs would not be retained the RAF after their release group had been reached.—M Harold Macmillan replied: In these categories it has onl been necessary to restrict the release of nursing orderlies i the group-lists so far promulgated.

INFECTIOUS DISEASE IN ENGLAND AND WALE

WEEK ENDED JUNE 2

Notifications.—The following cases of infectious diseas were notified during the week: smallpox, 0; scarle fever, 1233; whooping-cough, 982; diphtheria, 436 paratyphoid, 8; typhoid, 8; measles (excluding rubella 10,455; pneumonia (primary or influenzal), 486 puerperal pyrexia, 104; cerebrospinal fever, 44; polio myelitis, 3; polio-encephalitis, 0; encephalitis lethargic 2; dysentery, 458; ophthalmia neonatorum, 72 No case of cholera or plague was notified during the wee but there were 3 imported cases of typhus—1 each a Saffron Walden, Bradford, and Cardiff.

The number of service and civilian sick in the Infectious Hospita of the London County Council on May 30 was 956. During th previous week the following cases were admitted: scarlet fever, 38 diphtheria, 17; measles, 63; whooping-cough, 11.

Deaths.—In 126 great towns there were no death from enteric fever, 2 (0) from scarlet fever, 2 (0) fro measles, 4 (0) from whooping-cough, 11 (0) from dip theria, 50 (8) from diarrhœa and enteritis under tw years, and 5 (0) from influenza. The figures in pare theses are those for London itself.

Stockport and Birmingham each reported 4 deaths from diarrhœ and enteritis.

The number of stillbirths notified during the week wa 253 (corresponding to a rate of 35 per thousand tota births), including 31 in London.

On Active Service

AWARDS

The following is the citation on an award of the DS already announced in our columns.

Colonel G. M. Warrack was ADMS of the First Airborne Divisio at Arnhem. The dressing-station which he had organised becan involved in the fighting area and eventually fell into German hand The battle continued to rage on either side of the buildings use until the final evacuation of our troops. During this time th treatment of casualties became increasingly difficult. There we large numbers to be dealt with and the area was at times under fi from both sides. The firm attitude adopted by tl the Germans, however, and his insistence that o the medical personnel received proper treatment There was a considerable shortage of food and wa and Colonel Warrack, after an interview with the German con mander, managed to arrange for our jeeps, during the battle, t draw water from German-held sources. Despite constant shellin and mortaring, he passed to and from the hospital through th German positions to the divisional headquarters and kept bot places informed. After the withdrawal of our forces south of th Rhine, Colonel Warrack was put in charge of the hospital a Appeldoorn, which was receiving our casualties from Arnhem. Th initiative and organising ability shown by him was first-class. B his tactful handling of the German authorities, and his insistenc on the terms of the Geneva convention, he was able to arrange th the treatment in the hospitals and the subsequent evacuation we carried out as comfortably as possible. When the final evacuatio to Germany was ordered, he arranged for the necessary doctors an medical orderlies to accompany the parties of casualties and the by various means, he managed to hide from the German authoriti and eventually escaped into Dutch hands. He remained in hidin until the necessary arrangements could be made for him to b passed over the Rhine.

Letters to the Editor

MEDICAL STUDENTS AND BELSEN CONCENTRATION CAMP

SIR,—As the medical students from the London teaching hospitals are today leaving Belsen concentration camp I should like to take this opportunity of paying a tribute to the work that they have carried out during their stay.

They arrived at a time when conditions in this horror camp were still indescribable; the first and only problem was the production of order and supervision of feeding in the huts, to save the lives of those that had to wait their turn and to ensure the speediest evacuation of all those that could be saved. The work of this type that they carried out is beyond praise and, entirely by their initiative, a hospital area was formed in the original camp in which the worst cases that had to wait to the last were nursed and undoubtedly saved. Working too under the worst possible conditions, individual supervision of all the other huts was carried out and treatment where possible commenced.

Later when the whole camp had been evacuated they were able to take full advantage of the wealth of clinical material available, and to carry out work of an entirely medical nature. This they did with equal zeal and enthusiasm.

The experience, apart from its medical side, has I feel *given them a unique opportunity in that they* were given the heaviest of responsibilities and their initial efforts depended entirely on their own initiative. One and all they threw themselves into the task with unbounded enthusiasm; they worked long hours in the worst possible conditions and never spared themselves.

The results speak for themselves, and the fall in the death-rate was I am sure largely due to their magnificent work. Thousands have cause to be grateful to them that their lives have been saved. The units of the RAMC in Second Army are no less grateful for the help that was so generously given.

H. L. GLYN HUGHES,
Brigadier; DDMS, Second Army.

BLA, May 28, 1945.

GENERAL PRACTICE A SPECIALTY?

SIR,—General practice is the study of diseased individuals in their social, economic, and hygienic environment. The textbooks and teachers of medicine are focused on the latter relationship. Psychosomatic medicine relates social and economic factors with the ætiology of both neurotic and organic disease. This approach to medicine is of great importance to the general practitioner, who can become the undisputed specialist in this new attitude to disease. The GP does not need to journey to a great school of medicine to gain experience or to study clear-cut samples of this "new" disease group. If he is a good doctor he already interests himself in the history and development of every family on which he attends; he becomes increasingly aware of the powerful impact of anxiety, frustration, loneliness, and resentment on the health and functions of the body.

Psychosomatic therapy demands that we boldly challenge the bottle of sedative mixture wherever a ue cure can be wrought by discussion, readjustment, nd social rehabilitation. As this new outlook, this opeful light on ætiology, develops more confidently, will be found to uncover the dim roots of such condi-ons as ovarian and uterine disease, gall-bladder disease, asal sinus disease, arteriosclerosis, and hyperpiesia. ven bacterial invasions most often occur in a patient ho is "run down"; and this latter condition is deter-ined by environmental stress and strain.

This field of medicine requires thoroughly investi-ating on the spot by experts in the work. The GP s the trained observer capable of undertaking this new rusade in therapy which will compare in the years head with *the development of surgery* and its mira-ulous cures of a world in disease and pain.

We are in control of most surgical and bacterial iseases. But do we realise that, in an unknown pro-ortion of our triumphs, we are only controlling the last tages of a psychosomatic condition? Attack on psychosomatic disease is the GP's specialty, and if it is not undertaken soon our society will become neurotic to the core. There is a startling increase in somatic neurosis resulting in breakdowns in health, inefficient work, and complete incapacity. Except in the early stages or in mild cases, sedatives and rest are contra-indicated and only confirm the patient's disease into a chronic and disabling malady which may continue for years.

But the work will be exacting and demands a high standard of spiritual integrity and unselfishness of its practitioners. To quote the last two sentences of your annotation: "Certainly there is no room, in general practice, or in any other branch of medicine, for the man who will not make full use of the qualities he possesses. [And may it not be added: "the knowledge that is available"?] Our aim must be to establish a medical service which is hard to enter and offers no resting-place to the slack and incompetent."

Grange-over-Sands, Lancashire. P. D. MULKERN.

SIR,—Dr. Barber speaks about general practice with a much wider knowledge than I can command, but I can sympathise with much that he says and yet regard his proposal for a Diploma in General Practice with misgivings.

In the recent past diplomas or licences have been freely hung on both large and small branches of medical know-

to more witty ridicule
O. H. Mavor's satire
Omphalology." That

we were really asking them

or by handfuls of the alphabet after our names, rather than by the fruits of our experience, knowledge, and understanding.

I cannot think that a diploma held by "re-examination at intervals" would act as an "incentive" to any conscientious, hard-working practitioner, nor would its possession be any indication of his merit. When the profession settles down after the war general practitioners should have increased facilities for regular postgraduate "refresher" courses, such as those held at the British Postgraduate School. I agree, too, that regular weekly teaching rounds should be available in larger hospitals throughout the country. It will be satisfactory if such facilities are given, but I feel sure that a diploma which has been "made to carry sufficient weight" will tend to spoil rather than popularise these facilities.

Indeed there are possible circumstances in which that "sufficient weight" might become like the weight of a millstone round the necks of future generations of doctors.

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Redhill County Hospital, Edgware. G. H. JENNINGS.

THE GOODENOUGH REPORT

SIR,—Sir Ernest Graham-Little in your issue of June 2 describes as a serious example of the authoritarian trend

been at all
"financial
ly fair and

elementary educational principle.

It is to be hoped that the university committee-men referred to in Sir Ernest's letter, who show symptoms of revolt at this drastic example of State tyranny, will exercise self-restraint in spite of this serious provocation. They will need all their strength for their protests in the *not-too-distant future, perhaps, when* the State realises its obligations more completely and enables medical education to be provided on the widest possible basis, available to all, on merit, irrespective of sex and bank-balance.

Sutton Emergency Hospital, Surrey. D. SHAW.

SCRUB TYPHUS

SIR,—Your editorial of March 10 is timely, since it focuses attention on a disease that has caused many casualties and much dismay in the Allied armies in the Eastern zone of operations. With the diminishing incidence and severity of malaria, due to the increasing success of DDT and drug prophylaxis, the importance of scrub-typhus (tsutsugamushi) has been thrown into greater relief; in one theatre it is probably by now the only disease that kills men in more than trivial numbers.

The cause of this unwelcome, though not entirely unexpected, emergence of scrub-typhus from obscurity to notoriety is not far to seek. Man's irruption in large numbers into the haunts of this hitherto "silent" rickettsial infection has disturbed to his cost the noiseless tenor of its way. Long known to exist as an infection of mites and their hosts, predominantly small rodents, by reason of the scanty human population at risk it had rarely obtruded in epidemiological statistics; although it has for some years presented an interesting laboratory study because of its kinship to other diseases of the typhus group. Now, however, when man in his thousands has of necessity offered himself as an alternative host—i.e., has to a much greater degree than formerly supplanted the rodent as a host of the mite—the incidence has correspondingly soared.

As the last paragraph of your article indicates, the situation is in hand; the medical services of the Allied armies are fully appreciative of the situation. Intensive investigation and application of counter-measures are proceeding. The strenuous endeavour of military and lay medical authorities alike, and in particular of the medical entomologist and of the virus worker, at least belies the aspersion "forgotten army," so often applied by the uninformed to our troops in the East.

There are two impressions given in your editorial that require clarification, lest inaccuracies should find a place in the textbooks of tropical medicine.

Firstly, the statement is made that "the incidence of scrub-itch is said not to be invariably synchronous with that of scrub-typhus." In Malaya, where in pre-war years much study was given to the disease, and in adjacent territories since the outbreak of the Japanese war, scrub-itch has been a rarity; and seldom, if ever, associated with the occurrence of scrub-typhus. Indeed, the opinion generally held amongst medical entomologists is that the two conditions are caused by separate species of mites. It has been our experience that the victim of scrub-typhus almost invariably has been entirely unaware of having sustained a bite. Would that it were otherwise; for then the severity of an ensuing infection could perhaps be reduced by serum therapy or chemotherapy applied early in the incubation period.

Secondly, you say that "already several forms of supposedly tick-borne typhus—tsutsugamushi, Malayan scrub-fever or rural typhus, and Australian Q fever—have been shown to be mite-borne." This statement betrays an unfamiliarity with the literature of the typhus-like fevers.

Thus, concerning Australian Q fever, D. J. W. Smith (*Aust. J. exp. Biol.* 1942, **18**, 103) transmitted the disease by feeding infected nymphal and adult ticks of the species *Hœmaphysalis humerosa* on guineapigs, and demonstrated the high infectivity of the fæces of this tick. He also showed (*Ibid*, 1942, **20**, 213) that the adult form of the scrub-tick, *Ixodes holocyclus*, could transmit the virus. F. M. Burnet (*Med. J. Aust.* 1942, ii, 129), reviewing the evidence for transmission, concluded that in nature the cycle is probably bandicoot—*H. humerosa*, but that the tick *I. holocyclus* probably provides the link between that cycle and the source of infection in the abattoirs. I have been unable to trace any later reports that could supplant the above findings and conclusion by offering evidence of mite transmission of Australian Q fever.

Concerning "tsutsugamushi, Malayan scrub-fever or rural typhus," which are one and the same entity (viz., tsutsugamushi) these have never been "supposedly tick-borne." The literal translation of the Japanese word "tsutsugamushi" is "disease mite." An alternative Japanese name for the disease is "kedani fever"; and "kedani" means "hairy mite." The vector in Japan and Formosa is the *Trombicula akamushi*; and "akamushi" means "red mite." The Japanese investigators have never wavered in their conviction that the disease is mite-borne. To abundant indirect evidence Miyajima and Okumura (*Kitasato Arch.* 1917, 1, 1) brought direct evidence when, by feeding on a monkey 28 larvæ of *Tr. akamushi*, hatched in their laboratory, they succeeded in producing a severe type of tsutsugamushi, with two characteristic necrotic ulcers and attendant bubo. In the Netherlands-Indies, Walch and Keukenschrijver (*Trans. Far East Ass. trop. Med.* 1923, p. 627) obtained not only strong indirect evidence of mite transmission, but also direct evidence when, while searching coolies in the field in an endemic area of the disease, they took a larva of the species *Tr. deliensis* (closely resembling *Tr. akamushi* morphologically) from the skin of a coolie, who three weeks later developed the primary ulcer at the identical site at which the mite had been attached and ran the typical clinical course of the disease. In another coolie, another attached larval mite, *Tr. schuffneri*, induced a similar ulcer and syndrome.

In Malaya, Fletcher, Lesslar, and Lewthwaite (*Trans. R. Soc. trop. Med. Hyg.* 1928, **22**, 161) brought strong indirect evidence for the incrimination of the larval mite, *Tr. deliensis*, as the vector there. Lewthwaite and Savoor (*Brit. J. exp. Path.* 1936, **17**, 309) reported failure to transmit the virus by the ticks *Dermacentor andersoni* and *Rhipicephalus sanguineus* by the technique that has been uniformly successful in the hands of Parker and his associates in America in the case of the well-known tick-borne typhus-like fever, Rocky Mountain spotted fever. Later attempts by Lewthwaite and Savoor in the case of the ticks *Ornithodorus turicata* and *O. parkeri* likewise failed.

London. R. LEWTHWAITE.

A PARENT AT HOSPITAL

SIR,—Three of your correspondents express doubts about the facts given in my letter of May 19.

I can assure Dr. Nicholson that the hospital concerned was a cottage hospital; this was written over the door. The practitioner who advised admission *did* attend the patient in hospital. When she visited him there, twelve hours after seeing him before admission—i.e., about 8.30 PM—she brought a second doctor. I had not called him in and I was not introduced to him. I supposed, and was told, that he was connected with the hospital, and I described him therefore as a house-physician. This may have been inaccurate.

Dr. Bliss and Dr. Foster make various accusations. I am said to have called up a doctor in the middle of the night and to have ordered drugs and administered them. I regret that I did not make clear that I summoned the doctor in the morning: I telephoned the doctor's house between 7.30 and 8.0, leaving a message with her maid. It is perfectly clear from my letter that I did not *order* sulphadiazine, or administer it without medical advice. When I mentioned, with all due deference, that I possessed tablets of this drug, the doctor whom I had summoned was very glad of it, as there was a shortage of sulpha preparations in the town.

I am surprised that medical men should assume that the child must have had a temperature of 104° F when removed from hospital because this was his temperature 24 hours earlier, or that he should have been incapable of giving any account of the events of the night because he was delirious during the day. It is surely well known that drugs of the sulpha class frequently bring about very rapid abatement of acute symptoms. If I had been disposed to behave rashly I should have removed the child as soon as I was told that no instructions had been given as to his treatment, and that I was not allowed to stay with him to see that he had treatment. Instead of doing so, I endured anxiety and the hostility of the matron during the whole day until the doctor reappeared at night. Then I followed her advice and that of her colleagues and left the child in the hospital until morning when, as he was anxious to leave the place, I took him home with her sanction.

It would be surprising if a physician were able to remember long afterwards the details of a single case. But I do not think that any parent who has watched beside a child in danger will be surprised by the accuracy of my memory.

I had no motive whatever for "suppressing" this story until now. Until March I was fully engaged with more urgent work. Hearing then that THE LANCET had published criticisms of hospitals, I wrote and sent the letter, which you, Sir, for editorial reasons, held until May. It is true that I am a member of the Labour Party, but I am surprised that Dr. Bliss should have thought my letter political in tone. Is it "political" to be concerned about the health of people poorer than oneself, and can it be that Dr. Bliss has found that such concern exists only among Socialists? I am sorry that he should be so cynical.

I agree that a reasonable person is justified in not giving complete credence to a one-sided story. But I *do not think I can be criticised for not giving the names* of the hospital and doctors. I did not write my letter from personal motives, and have no wish to embarrass the people concerned. By giving my own name and the date, I provided an opportunity for them to give their version of the story if they wished to do so. I have received many letters from strangers who have had similar experiences and I think it would be well to face the fact that such incidents inevitably occur in a country that has not enough doctors, not enough nurses, not enough hospitals, and not enough public education in matters of health. Only by remedying these defects and by providing adequate medical care for all citizens, irrespective of means or status, can such incidents be wholly avoided.

But the rule of "no visitors" could at once be relaxed. If it were true that the presence of parents is bad for sick children, this rule would be found in nursing-homes and private wards. Studies of evacuated children have abundantly proved that young children may be gravely harmed by enforced separation from their parents.

Cambridge. PATRICIA RUSSELL.

SIR,—I am glad Lady Russell described her experience. What she described has happened to my knowledge to relations and patients. The treatment of patients and their relations does depend, sad to state, in many cases on those interested in them outside the hospital or on their ability to "demand."

If committees visited more thoroughly and showed clearly there was to be no distinction as regards the influence or financial circumstances of the patient it would be one step towards improvement. It may relieve Dr. Bliss's mind if I add my experience of some years spent in voluntary hospitals' training schools: such things did not happen to the extent of the present day. Now, I feel, both local-government and voluntary hospitals have allowed slackness to creep in.

Let us stop making excuses and admit that things are not as we wish, and place the *patient* first.

DOROTHY G. NICHOLLS,
County councillor; late matron, Marlborough
Cambridge. Maternity Section, Royal Free Hospital, London.

THE TRAINING OF NURSES

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It is

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was done to the report of *The Lancet* commission on the subject. The *Observer* published a leader on May 27, drawing attention to the proposed elaboration of the theoretical side of the nurse's training, and supporting your sound suggestions.

Those responsible for the new training regulations would like to introduce a far more extensive theoretical training at a time when there is an urgent cry for nurses in the country. Too much stress altogether has been laid on theoretical knowledge but I think it will be generally acknowledged that a good "academic" nurse is often much less practically useful than one with less theoretical knowledge, but with an aptitude and a "vocation" for nursing. The present attitude of the General Nursing Council appears to be based on the erroneous belief that the faculty for memorising a large amount of information (much of which is unnecessary) is essential for an efficient nurse, and as Lord Auckland stated in a recent number of the *Nursing Mirror*, "the time has now come when a firm stand should be made against the arbitrary manner in which the General Nursing Council treat both the nursing profession and the hospitals."

I entirely agree with your condemnation of the title

as a career. The position

has no means of promotion should not be tolerated by the medical profession.

The whole position is urgently in need of review, and to solve the problem radical changes may be necessary in the constitution of the General Nursing Council. The present difficulties have not been helped by the fact that

no longer allowed to under-

employed as ward sisters,

hole-time course.

It is not out of place to mention that I made similar representations to the Central Midwives Board in 1937, about

such

yed no small part in the present

Public Health Offices, Ilford. A. H. G. BURTON.

STRESS FRACTURES

SIR,—Perhaps it is opportune for a clinician to intervene in the dispute as to whether the absence of displacement is "essential" in stress or march fractures of metatarsals. Both Dr. Hartley and Dr. Morris are my

dy of the

possible

In my

appearance can be found in both groups (traumatic and stress) in the early, intermediate, late and healed stages.

The essential point about both "types" is that there occurs "a solution of the continuity of the bone(s)." In either "type" displacement may or may not occur. The later appearances depend solely on the presence or absence of displacement. In the early stages the shadow of the subperiosteal bony cuff may be seen prior to that of the "fracture." But for all we poor mortals know, the "fracture" may always be present prior to the callus. Because we cannot see it we are not at liberty to deny its existence.

Manchester. W. SAYLE CREER.

HOT BATHS AND HUMAN FERTILITY

SIR,—In 1922 Crew [1] suggested that in most mammals the optimum temperature for spermatogenesis may be lower than the body temperature, and that this may be the significance of the descent of the testes into the scrotum. Moore and Oslund [2] wrapped the scrotum of a ram in wool and left the wrapping in position for 80 days. Histological study then showed that there had been degeneration of the spermatogenic tissue, and no spermatozoon was seen in hundreds of tubules taken from various parts of the testis. The investigators concluded that the animal had been sterilised by the warmth of its own body.

Since then it has repeatedly been shown that warming of the testes of various mammals damages the spermatogenic tissue, and the work of MacLeod and Hotchkiss [3] shows that man is no exception to the rule. Six healthy young men were kept in a hot chamber, only their heads protruding, until the body temperature had risen to 40° or 41° C, the skin of the whole body (except the head) being exposed to the temperature of 43° C (109° F) for more than half an hour. Counts of spermatozoa were taken before and after the treatment. In every case the total number of spermatozoa per ejaculate began to fall and reached its lowest level some weeks after the treatment. Recovery occurred subsequently.

It was first suggested by myself seventeen years ago [4] that ordinary hot baths might reduce the fertility of men. My own experiments were inconclusive, probably because an insufficient time was allowed to elapse between treatment and examination. MacLeod and Hotchkiss have been the first to make relevant experiments on men. Strangely enough, they are entirely concerned

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1. Crew, F. A. E. *J. Anat.* 1922, 56, 98.
2. Moore, C. R., Oslund, R. *Amer. J. Anat.* 1924, 67, 133.
3. MacLeod, J., Hotchkiss, R. S. *Endocrinol.* 1941, 28, 730.
4. Baker, J. R. *J. Hyg., Camb.* 1928, 27, 131.

with the effect of fevers and do not mention that their work implies the possibility of a connexion between hot bathing and infertility. As Pincher[5] points out, their experiments support my suggestion that hot bathing *may reduce human fertility, and the subject seems to* call for thorough investigation.

If such an investigation is undertaken, it should be remembered that there is an altogether different way in which bathing may affect fertility. Soaps are strongly spermicidal.[6] No woman who was anxious to have a baby would soak herself (vagina included) in a weak solution of quinine shortly before coition; but few would have any hesitation in soaking themselves in a soap solution in a hot bath or in applying soap directly to the vagina, although soap is more spermicidal than quinine. It is important to know whether it commonly happens that enough soap is left in the vagina to affect the vitality of spermatozoa.

Dept. of Zoology and Comparative Anatomy, Oxford. JOHN R. BAKER.

PENICILLIN-SULPHONAMIDE MIXTURES

SIR,—It has been proved that penicillin in vitro is many times more potent than any of the sulpha drugs. In some quarters it has been suggested that this superiority is also detectable in clinical trial. It is therefore interesting to read in your issue of May 19 that Hendry, Gledhill, and Price found "little difference between wounds treated at primary operation with sulphonamide powder and those treated with a mixture of calcium penicillin and sulphathiazole." In the same issue a similar opinion was expressed by Bhatia.

The continuous reiteration that penicillin is only the handmaiden to good surgery, and that better and better primary wound surgery is necessary if penicillin is to show its full potency, seems an obscure argument. If in clinical tests penicillin were indeed many times more powerful than the sulpha drugs, would not more and more cases be recorded where excellent results had been observed after inadequate primary treatment?

In *The Lancet* of May 12 J. J. Mason Brown describes *his method of classifying successful and unsuccessful* results of late suture, and reports that, using penicillin, his failure-rate was only 8·6%. Two years ago E. A. Jack and J. Charnley described the results of the two-stage operation as applied to amputation, but in this case using sulphonamide powder (*Brit. med. J.* 1943, ii, p. 131). Classifying the results in the same way as Mason Brown this gave a failure-rate of 8%. The common factor was the principle of two-stage closure.

Recent papers in your columns (Bigger, Todd) have shown that penicillin in vitro is most active when the organism is in the actively dividing state; and it is increased when substances are added which accelerate division (e.g., rabbit serum). By analogy it would seem that the addition of a bacteriostatic would reduce the efficacy of the penicillin. This is a subject on which more laboratory information would be welcome in the popular journals if sulphathiazole-penicillin is to be regarded as more than crude blunderbuss mixture. My own experience gives the impression that sulphathiazole-penicillin powder is, for all practical purposes, no more potent that sulphathiazole alone.

Military Hospital, Shaftesbury. J. CHARNLEY.

MALE NURSES AT VD CLINICS

SIR,—In many clinics for venereal diseases men are treated by orderlies while women are treated by fully trained State-registered nurses. It is true that the orderlies sometimes work under the control of a trained sister, but this is of little benefit to the patient since she does not take any part in the treatment. Much improvement could, we believe, be secured if doctors in charge of these clinics were aware that there are fully trained State-registered male nurses whose employment would give the male VD patient the same skilled treatment that is given to the female. Many of these are at present in the Forces, but they will be available in increasing numbers.

H. GASKELL,
General Secretary, Society of Registered Male Nurses.

2, Haslemere Avenue,
Barnet, Herts.

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5. Pincher, H. C. *Nature, Lond.* 1945, 155, 272.
6. Baker, J. R. *J. Hyg., Camb.* 1931, 31, 189.

Obituary

LACHLAN GRANT

M D EDIN., F R F P S, D P H

LAST November at a gathering in Oban, which in cluded the Secretary of State for Scotland, Dr. Lachla Grant's friends celebrated his medical jubilee. Of thes 50 years he had spent 45 at Ballachulish, and the whol countryside will miss his skill and kindness as a doctor As a writer and speaker he had also done much to furthe the interests and development of the Highlands.

The eldest son of the late Mr. Peter Grant of Glencoe he was educated at Ballachulish public school and th University of Edinburgh where he graduated MB wit distinction in 1894. After holding house-appointment with Clouston at Morningside and with Argyll Robertso at the Edinburgh Royal Infirmary he went to Oban a assistant to the late Dr. Dove M'Calman in 1896, and i the same year obtained his MD with commendation Later he was appointed medical officer at the Gest Hospital at Edinbane in the Isle of Skye. Here h *remained till in 1900 he settled in practice at Ballach* ulish, where as medical officer for the district of Lismor and Appin he had charge of the Ballachulish Isolatio Hospital and the Glencoe Auxiliary Hospital. Durin the last war he was also medical officer to the prisone of-war camp at Kinlochleven. He was a justice of th *peace for Argyllshire.*

Dr. Grant was seized with the adventure of genera practice. Always interested in bacteriology, he set u his own laboratory, where for long he did much of th bacteriological work for the country. He was join author of a paper on vaccines in general practice and h urged in our columns and elsewhere that infection wa often carried in wash-hand basins both at home and i the hospital. He advocated the abolition of the wast plug and the use of an elevated tap, and it was typical o his inventive mind that he designed a suitable portabl spray which fitted on to ordinary hot and cold taps Industrial medicine was another of his specialties, an as consulting medical officer to the British Aluminiu Company he reported that among the workers under hi care he found no evidence of industrial disease resultin from that metal. He also found time for a good deal o eye work and ten years ago published an article on th prevention of eye-strain and light glare.

Dr. Grant died at his home on May 31. He leaves widow and three daughters.

CHARLES VINCENT DINGLE

M D, B HY DURH., D P H

Dr. Dingle was medical officer of health for the count borough of Middlesbrough from 1898 to 1936, during th period when the foundations of the health services of th town were being laid. He went to Middlesbrough during a epidemic of virulent smallpox which in 1897–98 attacke 1405 of the townspeople. His previous experience in th public health department of Newcastle stood him in goo stead during this difficult time, and from the experienc gained he became one of the foremost authorities o smallpox in the North of England. He was appointe medical officer to the Tees port health authority in 190 and on the establishment of the school medical servic became Middlesbrough's first school medical officer i 1908.

During his term of office Dr. Dingle tackled the hig infantile mortality, and the causative bad housing, wit vigour and determination, and was instrumental i carrying through some extensive slum-clearance schemes against much opposition. He saw a large part of th town converted from privy middens to water-carriag sewage disposal, and he established the maternity an child welfare services on a satisfactory basis. On hi retirement in 1936, he had seen the public health depart ment grow, through his guidance and inspiration, into very important and vital factor in the life of the town He was well loved by his colleagues and staff for hi kindly and courteous manner, and nowhere was hi cheerful personality more in evidence than in the various social functions in the hospitals and other institutions under the control of his department. He rendered hi fine public service efficiently yet modestly.

Notes and News

POSTGRADUATE TRAINING AFTER RELEASE FROM SERVICES

MEDICAL officers on release from the Services should apply for information on postgraduate facilities (see *Lancet*, April 21, p 507) to the following

Birmingham —Prof W H Wynn, Hospital Centre, Birmingham 15

Bristol.—Prof C Bruce Perry, Canynge Hall, Whatley Rd, Bristol 8

Cambridge —Dr A C D Firth Trinity Hall, Cambridge

Durham —Prof. R B Green, King s College, Newcastle on Tyne 1

[illegible] chool of Medicine, Leeds 1

[illegible] Jniversity of Liverpool

[illegible] Director, Central Office, [illegible] School, c/o London School of Hygiene, Keppel Street, WC1

Manchester —Dr G J Langley, The University, Manchester 13,

Oxford —Major General Sir Robert McCarrison, 41, St Giles', Oxford

Sheffield —Prof E J Wayne, The University, Sheffield 10

Wales —The Secretary, Welsh National School of Medicine, 10 The Parade, Cardiff

Scotland (Central Office) —Prof Sidney Smith, University New Buildings, Edinburgh 8

PLYMOUTH HOSPITALS COLLABORATE

PLYMOUTH has a large municipal general hospital and a large voluntary hospital (the Prince of Wales's) Advantages to be gained from pooling their resources have long been obvious, and we are glad to hear of action in this direction Until hospital services are rationalised, as would be done in a National Health Service, it is not feasible for the two hospitals to share all types of case, for the city of Plymouth is not prepared to provide for patients coming from outside its boundaries However, the medical officer of health, Dr T Peirson informs us that, for a start, the hospitals are to share equally in the reception of all acute medical and surgical ases arising in the city, for which purpose a central bureau ill be set up to which Plymouth practitioners can telephone henever they want a patient admitted The working of he bureau will be entrusted to a small committee formed qually by the Plymouth public health committee and the oard of management of the Prince of Wales s Hospital Before anyone is appointed to the visiting staff of either ospital, the advice of the bureau "strengthened by appropriate oopted members" will be obtained, and, by arrangement etween the two matrons, nurses may meet for joint in truction Each hospital will be on duty' for the reception f emergencies and casualties for six days at a time

A GROUP MEDICAL SERVICE

Two [illegible])

[illegible] a central clinic staffed by a nurse and assistant and attended by local practitioners working on a rota C F Richards, who describes the experiment in the May–June ssue of *Industrial Welfare and Personnel Management*, says hat through this cooperative effort the employees of the member firms have gained the advantages usually obtainable nly in large concerns

FOOD VALUES TODAY

THE Accessory Food Factors Committee of the Medical Research Council has published a set of tables giving the composition of the common foods now eaten in the British Isles (Nutritive Values of Wartime Foods HMSO Pp 40 1s) The tables have been compiled by Mr L R Bransby, Miss E M Hume, Dr R A McCance Wing Commander F [illegible] Macrae, Dr B S Platt and Miss I M W [illegible] various sources [illegible] surveys and in [illegible] quired Strict [illegible] because of the w [illegible] variation in the composition of samples of the same food this applies particularly to vitamin content. The tables which give the contents of water protein, fat and carbohydrate calcium iron, and vitamins A B₁ and C, as well as the calorie values, are divided into three sections The first section gives the composition of the edible portion of foods per 100 g In using this section the percentage of wastage stated must be subtracted from the total weight before calculating the value of a given sample of food Thus the protein content of the edible portion of sheep's head is 13 g per 100 g, but 50% is waste, so a kilogramme of sheep's head, as purchased, will contain 65 g of protein This correction is already made in the second and third sections, which give the composition of foods "as purchased," per 100 g. and per ounce No attempt is made to estimate losses in cooking, except in the case of canned foods sold ready cooked, but the introduction warns the reader that such losses are extremely variable, and suggests an allowance of 75% for the loss of vitamin C in green vegetables, and of 50% for other vegetables during large scale or ordinary domestic" cooking, compared with 15% for vitamin B_1, and nil for vitamin A

University of Cambridge

Prof E D Adrian, OM, FRS, will represent the university at the 220th anniversary of the Academy of Sciences of the USSR to be celebrated in Moscow and Leningrad this month

On June 8 the degrees of MB, B CHIR were conferred by proxy on R D Hearn and J M Davis The title of the degrees of MB, B CHIR was conferred on Mrs R C A Hunter during May

University of Sheffield

Dr G L Hermitte has been appointed temporary demonstrator in anatomy

Society of Apothecaries of London

On Tuesday, June 26, at 5 PM, in the hall of the society, Black Friars Lane, EC4, Major Dwight Harken, US Army, will deliver the Strickland Goodall lecture He will speak on foreign bodies in relation to the great vessels and heart

Faculty of Radiologists

The annual meeting will be held at the General Infirmary at Leeds on Friday and Saturday, June 29–30 Subjects of discussion include the treatment of melanoma, advances in radiological technique, and primary malignant tumours of bone

Central Council of Physical Recreation

The council is holding a demonstration of purposeful physical training in industry at the Conway Hall, Red Lion Square, London, WC1, on Friday, June 22, at 2 30 PM Tickets may be obtained from the secretary of the council, 58, Victoria Street, SW1

Health Canteens for India

[illegible] is to [illegible] India An appeal [illegible] the work The Al [illegible] have undertaken to maintain the first canteen and have accepted the founder s condition that the canteens shall not be used for political or religious purposes Donations may be sent to the treasurer of the Skippo Fund, National Provincial Bank, 64, Park Lane, London, W1

National Safety Congress

This year the Royal Society for the Prevention of Accidents is reviving its pre war annual congress and exhibition The congress will be held at the Institution of Civil Engineers, Great George Street, London, SW1, from June 18 to 24 There will be a session on home safety and another on child safety The industrial sessions will continue from June 21 to 23 The exhibition, which will be held at the London Scottish Drill Hall, Buckingham Gate, SW1, will remain open until June 29

Royal Medical Foundation of Epsom College

The 92nd annual meeting of the governors will be held next Friday June 22 at 4 PM, at 49 Bedford Square, London, WC1 Next day will be founder's day at Epsom and at 11 45 AM Surgeon Rear Admiral C P G Wakeley will distribute the prizes The average number of boys in the school in 1944 was 427 including 112 day boys of these 217 were the sons of medical parents This term there are 443 boys and it is hoped that by the end of next year the school will be practically full The foundation and trust funds this year will educate and maintain not more than 50 foundationers, and will assist 150 pensioners

Imperial Cancer Research Fund

At a meeting of the council held on June 7, Prof. H. R. Dean was reappointed chairman for the ensuing year and Sir Hugh Lett, vice-chairman. Dr. L. Foulds was re-elected Elizabeth Wills Allen fellow and Mr. R. J. Ludford, D SC, Alice memorial fellow.

Middlesex County Medical Society

At a meeting to be held at the Harefield County Hospital, on Wednesday, June 20, at 3 PM, Dr. E. Nassau and Dr. P. F. Kennish will analyse the cases admitted for treatment from the mass radiographic unit.

Bedside Dentistry in US Army Hospitals

A portable dental unit is being used in certain United States Army hospitals to assure bedridden patients more complete dental care. According to the office of the Surgeon-General, this " dentist's office on wheels " carries equipment for a wide variety of dental operations.

Royal Society of Tropical Medicine and Hygiene

At the annual general meeting at 26, Portland Place, London, W1, on Thursday, June 21, Dr. C. M. Wenyon, FRS, will be inducted as the new president.

British Association of Physical Medicine

The annual general meeting of the association will take place at 11, Chandos Street, London, W1, on Tuesday, June 26, at 4.30 PM.

West London Medico-Chirurgical Society

On Tuesday, June 19, at 8.30 PM, at Kensington Town Hall, Lord Moran will deliver the Cavendish lecture. His subject is to be the art of command.

Out from the Battle!

On June 12 Lieut-General Sir Alexander Hood opened an exhibition with this title illustrating the care of the wounded. It is held by the Red Cross and St. John War Organisation in the grounds of Clarence House, The Mall, London, SW1, and will be open from 11 AM to 7 PM (2 PM to 7PM on Sundays) till July 31.

Royal Society of Medicine

On Wednesday, June 20, at 2.15 PM, at the section of comparative medicine, there will be an exhibition of films of medical and veterinary interest. The section of orthopædics will meet at 2.30 PM, on June 23, at St. Vincent's Hospital, Pinner, Middlesex, when there will be a demonstration of cases by members of the staff.

Famine in Bengal

A few copies of the report of the Famine Inquiry Commission are now available at the publications branch, India House, Aldwych, London, WC2. The price of the report is 7*s*. 6*d*. post free.

Training for the Disabled

A committee formed from the Regional Orthopædic Hospital at Harlow Wood, Nottinghamshire, propose to found a college for the vocational training of men and women disabled in the Services, the mines, and industry. A site has been acquired next to the hospital, and an appeal for £70,000 is being made in the counties of Derby, Leicester, Lincoln, and Nottingham. The president is Winifred, Duchess of Portland, and the organising secretary Mr. J. L. Lee-Jones, New Square, Low Pavement, Nottingham.

Removal of Structural Precautions at Hospitals

The Minister of Health states that, now the war with Germany is over, he is prepared to consider proposals for the removal of structural precautions at EMS hospitals, especially where their removal is desirable in order to improve lighting and ventilation—e.g., bricked-up windows of wards, operating theatres, X-ray departments, and kitchens. Where this work can be done by members of the hospital staff without the use of outside labour, it is suggested that arrangements should at once be made to undertake the work. Where outside help is needed, it will be necessary to submit particulars to the Minister for approval, so that they may be considered in relation to other demands for building labour.

Hospitals at which a stretcher gas-cleansing unit has been erected are now at liberty to use it for other purposes.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

Chemistry and Industrial Welfare

A prize of £100 is offered to a fellow, associate, or registered student of the Royal Institute of Chemistry, under 30 years of age on Jan. 1, for an essay or papers on some aspect of the application of chemistry to the promotion of industrial welfare. Particulars from Mr. A. Taylor, ARIC, c/o Newton, Chambers & Co., Ltd., Thorncliffe Works, Sheffield.

Royal Sanitary Institute

A meeting will be held on Friday, June 22, at 10.45 AM, at the Royal Institution, Colquitt Street, Liverpool, when Dr. C. O. Stallybrass will speak on public health and the social services. In the afternoon Mr. L. H. Keay, the city architect, will read a paper on post-war housing.

The King has given permission to Mr. A. H. McIndoe to wear the decoration of officer of the Order of Polonia Restituta conferred upon him by the President of the Polish Republic in recognition of services during the war.

RATIONS FOR GERMAN PRISONERS.—Sir JAMES GRIGG stated in the House of Commons that the caloric value of the food now being given daily to non-working prisoners of war held in this country was about 2000 and that for workers is about 2900.

Appointments

FRASER, VIOLET, MB LOND.: temp. asst. MOH and asst. school MO for Reading.

GIBSON, JEANETTE, LRCPE: temp. asst. MOH and asst. school MO for Dudley.

PIACHAUD, R. A., FRCS: RSO at Newcastle-on-Tyne General Hospital.

The following examining factory surgeons have been appointed.

KING, ARTHUR, MB EDIN., Ilfracombe, Devon;
POLLARD, L. T., MB EDIN., Malpas, Cheshire;
JACK, W. J., MB ABERD., Ardlington, Lancs; and
HOLMES, EDWARD, MB MANC., Kendal, Westmorland.

Births, Marriages, and Deaths

BIRTHS

BROWNE.—On June 1, at Oxford, the wife of Squadron-Leader R. C. Browne, MRCP—a daughter.

CANDLER.—On June 1, at Exeter, the wife of Lieut.-Colonel P. L. Candler, RAMC—a son.

DAWES.—On June 3, at Oxford, the wife of Dr. G. S. Dawes—a daughter.

GOULD.—On June 5, in London, the wife of Surgeon Lieutenant D. W. Gould, RNVR—a son.

HARVEY.—On June 9, at Dorking, the wife of Dr. John Harvey—a son.

NORTHCROFT.—On June 3, at Oxford, the wife of Captain G. B. Northcroft, MBE, RAMC—a daughter.

RACE.—On May 31, at Cambridge, the wife of Dr. R. R. Race—a daughter.

RICHARDS.—On June 7, at Bristol, to Dr. Megan Richards (née Evans), the wife of Captain R. D. Richards, FRCS, RAMC—a daughter.

ROSENBLOOM.—On June 1, at Ootacamund, South India, the wife of Colonel A. Rosenbloom, IMS—a daughter.

WATTS.—On June 3, at Reading, the wife of Major J. C. Watts, RAMC—a son.

MARRIAGES

BICKFORD—DAVIES.—On June 8, in London, Reginald George Bickford, squadron-leader RAFVR, to Joyce Audrey Davies, captain RAMC.

BLISS—HOLLOWAY.—On June 2, in London, Theodore Bliss, MB, to Reba Noelle Gwyneth Holloway, MB.

COLENSO—MACRAE.—On May 1, in Halifax, Nova Scotia, Kenneth Arthur Colenso, surgeon lieut.-commander RNVR, to Doris Irene Macrae.

FARQUHARSON—TEW.—On June 5, at Glasgow, Charles Smith Farquharson, surgeon lieutenant RNVR, to Doris Ellen Tew, WRNS.

FOSBROOKE—THORPE.—On June 5, at Lytham, John Malcolm Fosbrooke, FRCSE, to Olive Irene Thorpe.

GARROW—OWEN.—On May 23, in London, Donald Hugh Garrow, surgeon lieutenant RNVR, to Pamela Rosamond Owen.

MACLEAN—HAUPT.—On May 31, at Friern Barnet, George Todd Maclean, MB, to Edith Nina Haupt.

DEATHS

BEATTY.—On June 1, Martyn Cecil Beatty, MB EDIN., lieut.-colonel RAMC retd., of Broadway, Worcs.

BOMFORD.—On June 1, at Johannesburg, Trevor Laurence Bomford, MD

BURNE.—On [illegible] ggins' Burne, MB LOND., late seni[illegible] States, husband of Catherine Violet Burne, MD, aged 65.

FERNANDEZ.—On June 5, Thomas Fernandez, MA CAMB., MRCS.

GRANT.—On May 31, at Ballachulish, Lachlan Grant, MD EDIN., FRFPS, DPH, JP, aged 74.

MOIR.—On June 7, at Swadlincote, Burton-on-Trent, John Hay Moir, DSO, MC, MD ABERD., DPH.

TAYLOR.—On May 29, William Joseph Taylor, LRCPI, of Ruan Minor, Cornwall.

STORAGE OF SKIN FOR AUTOGENOUS GRAFTS*

D. N. MATTHEWS, M D, M CHIR CAMB., F R C S

SQUADRON-LEADER RAFVR; MEDICAL OFFICER IN CHARGE OF A PLASTIC UNIT, ROYAL AIR FORCE

THE possibilities of skin storage were first considered as an answer to the problem of reducing the large number of operations with general anæsthetics needed to resurface the skin losses of airmen deeply and extensively burned in air crashes. A succession of operations, to which the patient is unsuited mentally and physically, had hitherto been unavoidable. This was because the time taken to resurface all the areas at one operation would be [illegible] ion would have to be [illegible] separated and all [illegible] clean enough for skin-grafting. This would mean that the areas ready first would have to wait until slower areas were also ready; during this time fibrosis would progress, and the functional and cosmetic results would therefore suffer. Skin storage reduces the number of operations to the short one needed to cut the skin. This can then be applied as a bedside dressing without anæsthesia as and when required.

A second use of skin storage is to reduce the number of donor areas needed in multiple-stage routine plastic repair of healed wounds. By using stored skin the patient is saved the pain of a second or even a third donor area, and the donor area often causes more pain than the field of operation during the first 48 hours. The duration of each operation, after the first, is also lessened by the time it would have taken to cut a fresh graft.

A third use is to provide a spare piece of skin in case the graft partially fails. Happily such partial failures are rare, but losses do inevitably occur from time to time from sepsis or hæmatoma formation. It is a comfort to the surgeon to know that such an eventuality is provided for without subjecting the patient to further inconvenience, pain, or risk.

Finally, stored skin will provide an experimental skin bank for investigating the problems of heterogenous grafting. These have so far defied elucidation; but by applying small pieces of skin, from the many grafts which are available in such a bank, to volunteers with granulating wounds in areas functionally and cosmetically unimportant, it may be possible to discover the factors needed for success. But successful takes from one person to another are unfortunately very rare, apparently because a heterogenous graft excites an immunity reaction in the host, so bringing about its own death.

METHOD OF STORAGE

It is common knowledge that general death—death of a person—is not immediately followed by cellular or elemental death, and that the rate at which cellular death supervenes is influenced by the temperature of the body. Lowering the temperature slows the autolytic action of the tissue enzymes and the destructive power of the micro-organisms. By lowering the temperature the rate of metabolism of cells is reduced so that they pass from a state of normal "active" life into a state of "latent" or suspended life. Carrel (1912) reported several experiments bearing on this subject between 1906 and 1911 and de Martigny made brief reference to it in 1913. It is also possible to preserve skin in a state of active life—that is, at its normal temperature and at its normal rate of metabolism—by growing it on suitable nutrient media. This is known as tissue culture. But this is impracticable from the therapeutic standpoint. The risk of sepsis destroying the graft is very great, besides which elaborate apparatus and the wholetime work of a skilled technician are needed. Preservation in a state of latent life is much easier.

Saline, Ringer's solution, liquid paraffin, and 'Vaseline' were tried as media in which to store the skin. It was stored in a household refrigerator which maintains [illegible] first the grafts [illegible] in one of these [illegible] actually submerged in it. This was soon abandoned in favour of gauze tightly wrung out of these media, because the grafts were found to become œdematous and lose their elasticity after a few days. It was also found necessary to preserve the skin in air-tight containers. The standard technique which has been in use for the last eighteen months is as follows:

The graft is folded with its raw surfaces opposed as far as its shape allows. It is then wrapped in a piece of tulle-gras and this in turn in a piece of gauze tightly wrung out of normal saline. It is then put in a sterile air-tight screw-topped glass bottle having a cubic capacity of 20 c.cm. It [illegible] for it to rest on; if this is not done the submerged part becomes œdematous (fig. 1).

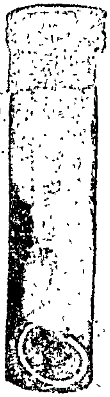

Fig. 1—Grafts wrapped in tulle-gras and swab wrung out in saline and stored in screw-capped bottle. Lead foil ring to keep graft clear of saline.

INVESTIGATION OF THE STORED SKIN

Macroscopic appearance.—A refrigerated graft is indistinguishable from a fresh graft. Its colour is normal. Its cut surface is moist and has a normal sheen. Blood left on the cut surface when it was stored is still fluid. The graft is of normal texture and elasticity. A thick graft exhibits the same tendency to curl at its edges as fresh skin.

Microscopic appearance.—The majority of grafts are normal. Occasionally there is slight retraction of the protoplasm in some of the cells in the deeper layers of the epidermis. This vacuolation does not affect the take of the graft. So far skin has been preserved seven months without any histological change occurring (fig. 2).

Power of [illegible] ne [illegible] of [illegible] of [illegible] culture by Miss Honor Fell, D SC, director of the Strangeways Research Laboratories. Skin stored for 8 days was put up in the usual manner by suspending it on a hanging-drop preparation of a medium consisting of equal parts of chicken plasma and embryo extract, the dermis of the graft being so orientated that it was in contact with the medium. Fibroblasts began to sprout after 8 days and cells were seen in mitosis after [illegible] the refrigerated grafts were [illegible] s were infected with the normal [illegible] *Staphylococcus albus, aureus,* [illegible] *catarrhalis*, and diph[illegible] were all found on occasion. But despite the [illegible] of these organisms on the grafts they had [illegible] effects even after [illegible]

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* Synopsis of Hunterian lecture delivered at the Royal College of Surgeons, April 27, 1945.

AB plasma prepared at the blood-bank at Luton and dried in small bottles containing 10 c.cm. of plasma at the MRC drying unit at Cambridge. The most satisfactory thrombin was 'Thrombin Topical' (PDCo). The plasma has been reconstituted in four times normal strength by adding 2·5 c.cm. of sterile distilled water. The thrombin has been dissolved in sufficient sterile water to give a strength of 5000 Iowa units per c.cm.

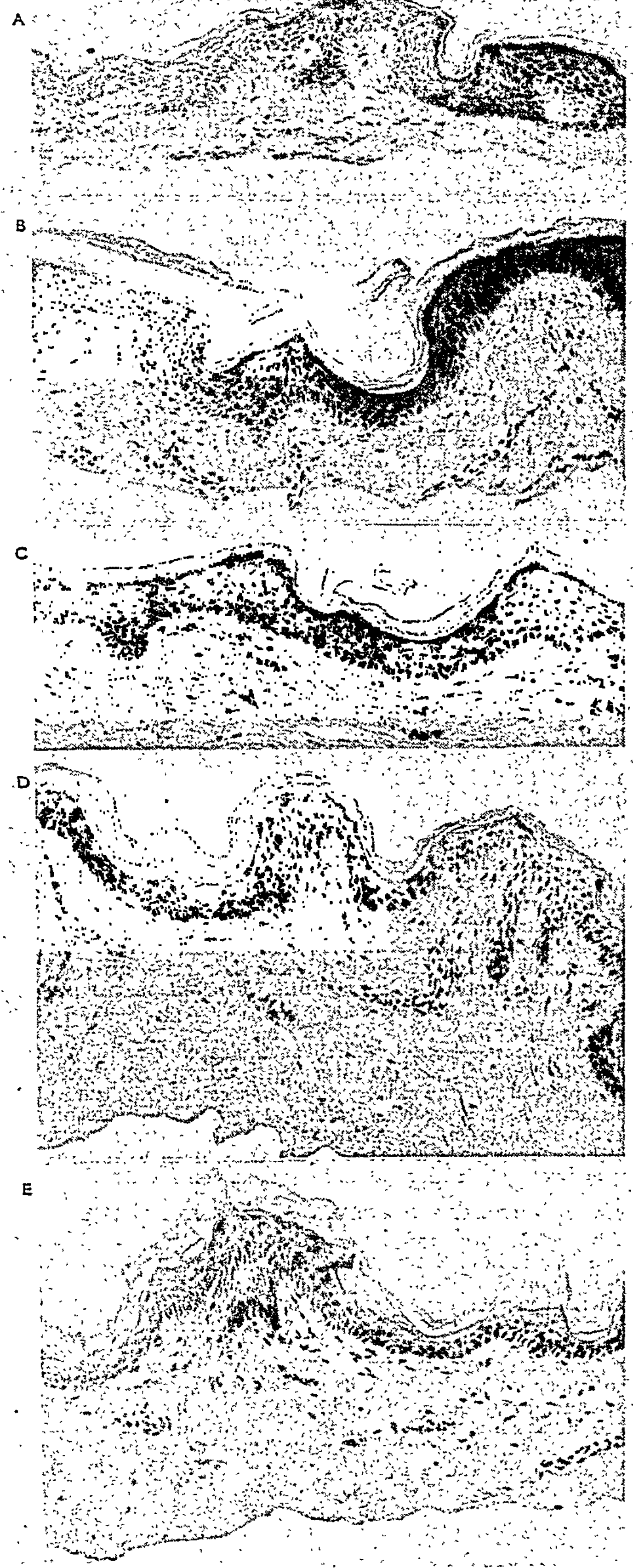

Fig. 2—Normal histology of skin after storage. ×110. (A) Fresh skin. (B) After one week. (C) Six weeks. (D) Three months. (E) Seven months.

This report reviews the results of the first 50 refrigerated grafts applied. The grafts were of varying thickness ranging from thin Thiersch grafts, approximately 0·015 in. thick, to split-skin dermatome grafts approximately 0·035 in. thick.

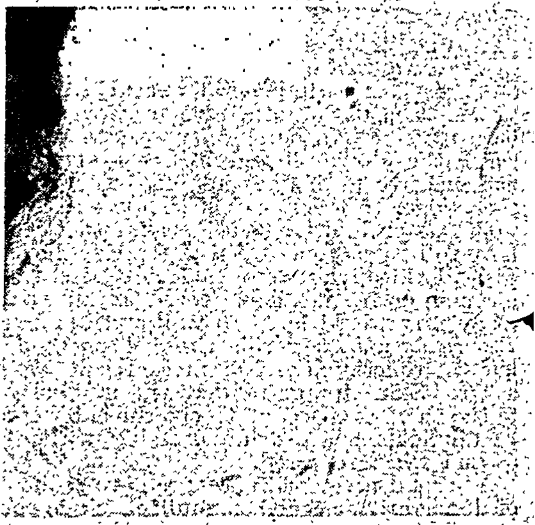

Fig. 3—Tissue culture of stored skin, showing fibroblastic growth and cells in mitosis. (Original skin seen top left.) ×90.

CLINICAL TRIAL

The first 5 patients on whom refrigerated grafts were used had the grafts applied for experimental purposes to the donor areas created by cutting the grafts. Eighteen were suffering from extensive burns; the grafts were used on these patients to resurface granulating areas as they became clean after the separation of the sloughs. Fourteen patients were suffering from soft-tissue wounds from a variety of causes; these grafts were also used to epithelialise granulating surfaces. Thirteen patients were undergoing the repair of healed deformities or contractures; 10 of these grafts were used to save the patient a second or third donor area in multiple-stage repair and 3 to make good the partial loss of the original graft or skin-flap.

Grafts applied to donor areas.—In each of the 5 cases where stored skin was applied for experimental purposes to see if it would take the technique was the same. The small pieces of skin left over during a grafting operation were stored. Four days later a corner of the donor area was uncovered and several pieces of stored skin were set in place. The behaviour of the grafts was very much the same in all 5 cases. The grafts took satisfactorily, and after they had been in place five days looked normal. But during the following week, as the normal healing of the rest of the donor area was nearing

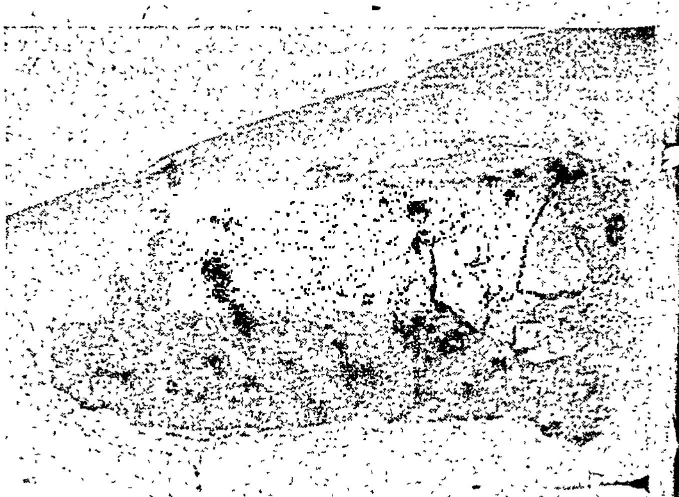

Fig. 4—Stored grafts applied to donor area, showing edges of grafts lifting as healing nears completion.

completion, they became raised up above the level of the surrounding surface and hyperkeratotic. Some looked as though they were undergoing the early stages of keloidal change. Later their margins became free where attachment had previously been secure. Beneath the loose edges the normal healing of the donor area was seen to have taken place. Quite large areas of most of the grafts separated in this way, drying up like parchment. The amount of separation seemed to vary with the depth at which the

the donor area

was presumed

hal islands in t

coalesced, and forced the graft from its temporary attachment to the exposed tips of the dermal papillæ to which it had become fixed. The variation in the degree of separation according to the depth of the donor area seemed to support this—the fewer the epithelial islands remaining the less the tendency to separate (fig 1)

These 5 experiments proved that skin would take after four days' storage when applied to a raw surface. Whether the take would have been permanent if there had been no epithelial elements beneath the grafts, and whether the conjecture was correct that these buried epithelial elements were responsible for the separation of the grafts, was not proved, but it seemed reasonable to try the application of stored skin to a granulating wound.

Grafts applied to granulating surfaces.—At first grafts were applied which had been stored only 18 hours. Subsequently grafts were used after storage up to 21 days;

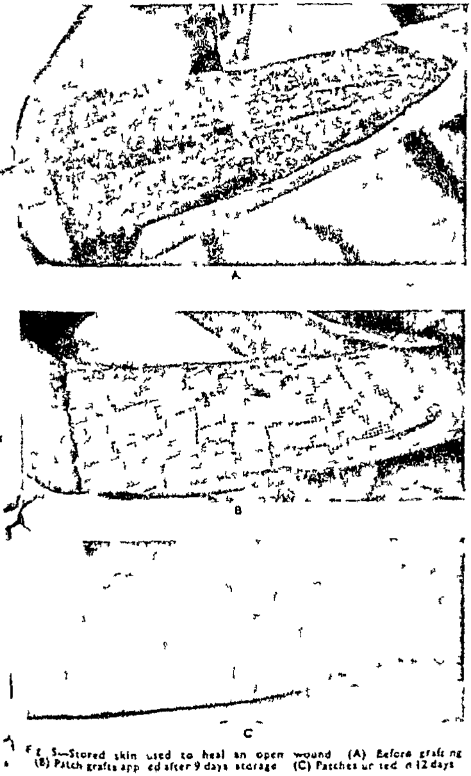

Fig 5—Stored skin used to heal an open wound (A) Before grafting (B) Patch grafts applied after 9 days storage (C) Patches united in 12 days

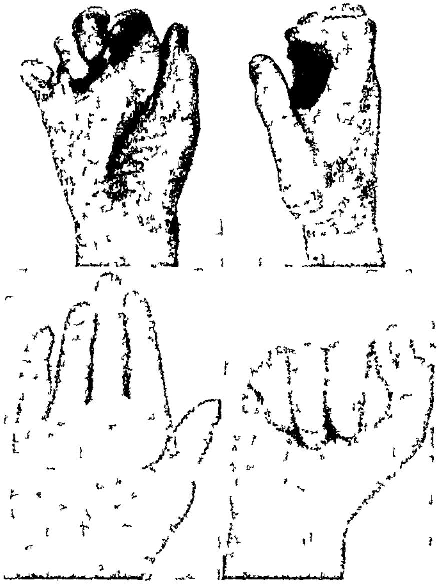

Fig 6—Stored skin used in plastic repair of healed deformity (burn) Index and 5th fingers repaired with fresh skin 3rd and 4th fingers and subadjacent palm grafted with skin stored for a month Above before repair below 4 weeks after repair

none was needed for granulating surfaces after storage for more than this time. When the first dressings were taken down the grafts were found to have taken satisfactorily. In all but one of the cases where part of the graft was applied fresh and part after storage the refrigerated grafts gave a higher percentage take than the fresh skin, but the series of cases is too small for coincidence to be excluded. Bacteriological proof of the control of infection with chemotherapy was obtained in all cases before the grafts, fresh or refrigerated, were applied.

It is interesting to note that de Martigny said in 1913, "we have noticed that tissues preserved for several days at least in cold storage give us better results when they are used", and that Carrel (1912), when discussing the tissue culture of pieces of skin, said, "When they cease to proliferate I place them in cold storage for several days in a state of latent life, then when I replace these tissues in a medium suitable for their culture I have observed a new and active growth of cellular proliferation." It is well known that temperatures of 3°–6° C do not kill micro-organisms, and, as has already been stated, the contaminants of normal skin have been cultured from these stored grafts. It is also true, however, that these organisms were found to have had no harmful effects on the grafts even after seven months' storage. It is possible therefore that refrigeration enhances the resistance of the skin to certain organisms. It is also possible that after refrigeration an outburst of fibroblastic proliferation accelerates the rate of take and of vascularisation of a graft when it is applied to a wound. The problem warrants further investigation.

The rate of growth of the epithelial margins of stored grafts shows no difference from that of fresh skin, judged by the time taken by postage-stamp grafts to bridge the gaps between the patches. Gaps of approximately ½ in. are closed in about ten days with both types of skin (fig 5)

Grafts applied to wounds with surgically healed tissues.—The grafts used in routine plastic repair have been applied between three and eight weeks after storage and have taken satisfactorily. None has so far been needed after storage for more than eight weeks. The rate of vascularisation, the colour match, the texture, pliability, and rate of softening have been the same as in fresh grafts (fig. 6).

SUMMARY

The use of stored skin has been adopted as a means of reducing the number of operations required in grafting a large raw area.

Experimental work has been done on the method of storage, and the macroscopic and microscopic appearance of the skin after storage. Tissue-culture has demonstrated the power of growth of the cells of stored skin.

The use of fibrin instead of stitches to fix the skin is advocated under some circumstances to obviate the necessity for an anæsthetic.

The results of the first fifty grafts of stored skin are reviewed.

There is a possible relationship between refrigeration and an increase in the power of the skin to withstand infection by some organisms.

I am indebted to Air Marshal Sir Harold Whittingham, DGMS, RAF, for the facilities which enabled me to do this work and for permission to deliver this lecture; to my colleague, Squadron-Leader D. C. Bodenham, who has worked with me throughout; to Miss Honor Fell, D SC, director of the Strangeways Research Laboratories; to Dr. H. F. Brewer, director of the Luton Blood-bank; to Dr. Gilson of the MRC Drying Unit at Cambridge; and to Dr. Marmion of the Department of Pathology, Cambridge University.

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MANAGEMENT OF TRAUMATIC PYOTHORAX

J. LEIGH COLLIS, B SC, M D BIRM., F R C S
MAJOR RAMC

M. H. ARMSTRONG DAVISON
M D DURH., D A
MAJOR RAMC, TA

P. S. SMITH
M B CAMB.
CAPTAIN RAMC

CHEST SURGICAL TEAM

THE 44 cases on which this paper is based are instances of total or almost total pyothorax, and do not include patients with early infected hæmothoraces, in which the fluid present never became frank pus. The number is not large relative to the total of 710 admissions to the unit, but the high case-mortality of 27% (12 cases) emphasises its importance, while the prolongation of convalescence compared with uninfected cases cannot be overlooked.

Our experience has led us to believe that a localised empyema is sometimes unavoidable, but that total pyothorax, with the possible exception of cases associated with œsophageal injury or very virulent organisms such as hæmolytic *Cl. welchii*, is an avoidable condition. That is to say, providing pulmonary expansion is effected and maintained from the onset of treatment, infection can produce only a localised empyema.

The 44 cases show no single ætiological factor that can be blamed above all for the condition. The original wounds were as follows:

Abdominothoracic ..	7	Perforating injury (chest)	11
Œsophageal injury	1	Abdominal injury ..	1
Penetrating injury (chest)	32	Sucking wounds	17

In 12 cases there were retained foreign bodies within the thorax, and six of these measured 1 in. by ½ in. or more. Bronchial fistulæ were obvious in 15 instances, and absent in 22, with 7 cases where it was doubtful or the records are inconclusive. Great prominence is often given to bronchial fistulæ as an ætiological factor, but, in our experience they have not been common in early cases in spite of a lung wound; moreover their [illegible]rance later seems more a result of infection than a cause of the sepsis. In all these penetrating and perforating injuries there is a lung injury which is a potential bronchial fistula, but it usually seals itself off, and it is only when sepsis supervenes that it breaks down. In 17 of the 23 Allied patients adequate intrapleural penicillin therapy was used. In view of this, the figures must be taken as showing that penicillin is no guarantee of sterility, though its benefits are undoubted.

The key to the situation appears to be good treatment in every detail, and this must start within the first 24 hours. This includes good surgery and good aspiration with the use of penicillin and special methods where leakage of air from the lung endangers the success of efforts to re-expand the lung. When considering the first steps in their treatment, established cases of pyothorax fall into two main groups: (1) closed, and (2) open.

CLOSED PYOTHORAX

The closed group includes all cases where the pleural cavity has no opening to the exterior, either through the chest wall or via a bronchial fistula.

Early treatment.—The initial line of treatment is by aspiration. This is done in the first instance for diagnostic purposes and bacteriological examination, as well as for its therapeutic advantages.

The object of treatment is to reduce toxæmia and expand the lung. We have not cured any total pyothorax by aspiration alone, nor has it been possible to convert the condition into a localised empyema. The result is very different when one is dealing with an early infected hæmothorax, rather than an established pyothorax. The aspirations may be necessary daily or on alternate days, depending on the rate of collection of fluid, and are followed every 48 hours by the introduction into the pleural cavity of 50,000 units of penicillin in 2 c.cm. of water. The factors which prevent this treatment from being completely successful vary from case to case, but are to be found among the following:

1. Clot.
2. Penicillin-resistant organism.
3. Rigid lung.
4. Rapid production of fluid.

The reduction in toxæmia produced by aspiration is very considerable in all cases, though after a temporary improvement patients tend to slip slowly downhill. The deterioration in the patient's condition is particularly noticeable in the loss of flesh about the face.

Two other reasons are commonly given for aspiration at this stage. The first is to allow the mediastinum to become fixed. This is a difficult factor to assess, and, providing a closed drainage system is to be used we do not consider it important. The second reason is to allow the pus to become thicker. This depends on so many things that it provides us with little information, and certainly does not have any relation to the fixity of the mediastinum.

It will be seen that we find little benefit from aspiration when once frank pus is present, but, nevertheless we do employ it for a very limited number of days in order to obtain the slight initial improvement, to damp down the virulence of the organisms with penicillin, and to allow the patient to become accustomed to his new surroundings and recover from his journey.

At the last aspiration before drainage, 20 c.cm. of iodised poppy-seed oil is introduced, and postero-anterior and lateral radiograms are taken.

Operation is done through a small vertical incision just inside the lateral border of the erector spinæ, and the chest is opened through a resection of 1½ in. of the 9th or 10th rib. The incision is small to ensure good healing and a close fit of the tube. It is vertical for two reasons. The first is that it heals better this way. If a horizontal incision is made serous fluid or pus can collect under the lower edge, but if it is vertical outward drainage takes place more readily along the line of the incision. Secondly, after making a vertical incision it is easy to resect a portion of a rib one higher or lower if the first rib resection is found to be unsuitably placed.

The actual position of the drainage—just under the lateral edge of the erector spinæ—is most important. As is often the case in chest surgery, the surgical procedure is but a small part of the patient's cure. This is a good instance, because if the tube is put more laterally it will be many times more difficult to nurse the patient, and breathing exercises will be interfered with by pain from the proximity of the scapula to the tube From the nursing point of view it is essential to be able to support the patient comfortably in bed, and this makes it necessary to give support lateral to the tube Provided the tube is placed near enough to the midline, this can be effected by two vertically placed pillows resting on the back rest A horizontal pillow above these provides a rest for the head, and the tube passes out through the gap between the two vertical pillows

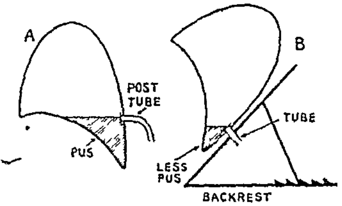


Fig 1

Some surgeons prefer to drain a total pyothorax from the axilla but fig 1 makes it clear that far more efficient drainage is obtained with a posteriorly placed tube The practice of using the posterior tube has to be modified in subtotal pyothoraces if there is a degree of pleural adhesion in the paravertebral sulcus

The choice of which rib to resect is made in the first place from the latest radiogram showing the iodised poppy seed oil in the pleural cavity With total pyothoraces it is usually necessary to drain rather lower than with postpneumonic empyemas It has never been our practice to drain at the lowest point in a pyothorax because when this is done the rise in the diaphragm during healing produces a long sinus leading to the cavity This makes correct placing of the tube difficult, and is apt to lead to intermittent drainage and chronicity

Intrathoracic procedure —Although the hole in the chest wall, with this rib resection, is small, it is large enough for a thorough clearance of all the intrapleural clot to be made through it This is an essential part of the operation and may be rather time consuming A sufficiently good view is only possible by introducing through the rib resection a malleable light as supplied by the Genito Urinary Mfg Co When this is completed, a flanged tube of the Tudor Edwards pattern is inserted and fixed in position with strapping across the outer flange

Anaesthesia is being dealt with fully in a separate paper, but it will be mentioned here that although local anaesthesia was used at first for these operations it has been given up in favour of cyclopropane This is particularly preferable in total pyothorax because clearing the clot may take rather a long time, and the better control of pulmonary ventilation is an advantage

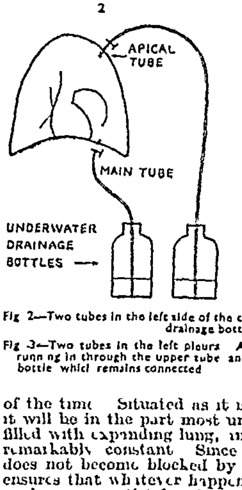
Aftercare —The patient is fitted up on a back rest, as has already been described and his tube is attached to an underwater drainage bottle Breathing exercises are started immediately although the patient may not always be fit for great exertion in the first few days

Two tube method —The above treatment was adopted in the early cases of our series but though in many respects it was good two disadvantages stood out First, *in spite of satisfactory general progress* many patients developed massive collapse of the affected lung Secondly, many cases were so heavily infected that the need to wash out the cavities was considerable If this was done by the standard method of running the fluid in through the side tube, while the main tube was disconnected, massive collapse was invited A further point was that when the lung was completely free it could fall backwards on to the opening of the drainage tube This did not always obstruct the drainage of fluid but it invariably prevented the escape of air It is of the utmost importance that continuous drainage should be maintained in the early days after operation, for there is then a chance of obtaining pulmonary expansion which will not later recur, except with prolonged treatment It is therefore essential that intermittent drainage should not be tolerated in the first week after operation

For these reasons it was decided to introduce a second tube at the time of drainage (fig 2) This second tube is placed at the extreme apex of the chest, and, in order to ensure this, it is inserted posteriorly, close behind the anterior edge of the trapezius muscle The exact surface marking of this is the point midway between the vertebra prominens and the superior angle of the scapula, the arm being at the side The tube used is an 8 inch piece of barium tubing, the same size as a no 6 catheter (English) It is inserted by means of a small trocar and cannula, and is connected to an underwater drainage bottle When washouts are desired (fig 3) the tube is occluded by a screw clip and disconnected from the bottle, and a funnel is attached A pint of fluid is allowed to run in, and the clip is immediately closed again The main lower tube is left attached to the second underwater drainage bottle the whole time By this means, only the pint of wash out fluid (Dakin's solution) enters the pleura, and runs out as fast as it flows in As a result, a washout is possible without the disadvantages of an open tube, while the fluid coming from the top gives more effective irrigation than might otherwise be obtained.

These washouts are very important, especially in heavily infected cases, but perhaps even more important is the advantage of the second tube for the remainder of the time Situated as it is at the top of the chest, it will be in the part most unlikely at this stage to be filled with expanding lung, and as a result its action is remarkably constant Since it is above the fluid it does not become blocked by pus or clots In fact, it ensures that whatever happens to the main tube there is always an outlet for air, so that if it is at all possible the lung will expand A further advantage of the apical tube is that it requires much less cooperation from the patient than the posterior tube It is impossible for the patient to lie on the apical tube, which is also unlikely to be pulled out, as a result the disasters which may accompany intermittent drainage are avoided

2



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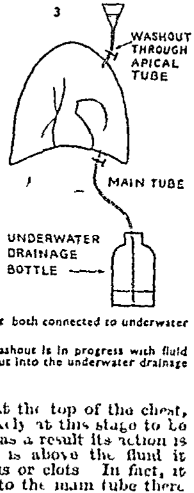

Fig 2—Two tubes in the left side of the chest both connected to underwater drainage bottles

Fig 3—Two tubes in the left pleura A washout is in progress with fluid running in through the upper tube and out into the underwater drainage bottle which remains connected

The time that this tube should be left in is a difficult point on which to be dogmatic Some cases cause no problem as the lung becomes completely expanded at the apex, and obviously the tube can then be removed In general, it appears to have served its purpose in about 2 weeks We have not experienced any trouble in getting the residual small sinus to heal up

Results —From the table it will be seen that with the two tube method pulmonary expansion was most gratifying The death rate too, although the total number of patients is small, is rather striking, since if any selection was used, it was to employ the two tube method in the worst cases

EXPANSION OF LUNG WITH VARIOUS METHODS OF DRAINAGE

Drainage	Pulmonary collapse	Lung expanding well	Indefinite	Total
Apical tube..	4	11 (2 died)	1	16
Single tube ..	12 (4 died)	4	2 (1 died)	18
Undrained ..	8 (5 died)	..	..	8
Wound tube	1	1	..	2

It will be [illegible] died with an apical tube, in spi[illegible]lmonary expansion. One of these was a German, in whom the hazards of the battle had caused a delay of 10 days before any treatment could be instituted for a severe sucking wound. He was terribly ill and completely mentally deranged on admission, and it was remarkable that he was kept alive for 8 days, and, for a time, gave hope that he might survive. The other patient was also a German, who, although progressing satisfactorily, died after a severe secondary hæmorrhage from an extensive defect of the anterior chest wall.

The 4 cases which did not show satisfactory pulmonary expansion demonstrate the limitations of this method. Two of these were Germans who had previously been treated by drainage, and had to be redrained on arrival at the unit. This bears out what has already been said about the importance of the early period after drainage. In these two, this valuable time had been wasted by the previous treatment in German institutions. Of the other two, in one the lung was noted to be very rigid at the time of drainage, and in the other a radiogram showed a completely black collapse of the affected lung. It is not felt that a satisfactory solution to this type of case has been found. It is interesting to note that bronchial fistula did not prove a serious obstacle to pulmonary re-expansion.

In the 11 cases which are stated to have the "lung expanding well" the degree of expansion varied, and in some a fair-sized cavity was still present on evacuation to the United Kingdom, but others were remarkably successful. In one patient, who had a total pyothorax without any adhesion at all, a pleurogram at the end of 18 days showed that his track and cavity were completely filled with 7 c.cm. of iodised poppy-seed oil, and that his lung elsewhere was completely expanded.

OPEN PYOTHORAX

In cases in which there is an opening into the pleura either through a broken-down sucking wound of the chest wall or via a bronchial fistula, no useful purpose is served by delaying operation for treatment by aspirations. Drainage has to be instituted forthwith, and is generally performed along the lines already laid down, though there are some particular difficulties in this group.

Bronchial fistula.—Two-tube drainage is used for these cases, though some modification of the wash-out routine has to be made if the Dakin's solution causes coughing. This can usually be overcome by employing a half strength solution or changing to saline, but the irrigating effect of this is not nearly so good.

(*a*) *Open sucking wound in costophrenic sinus posteriorly.*—These are a special problem; the position of the wound is not suitable for inserting a drainage-tube, and if a tube is put any higher the drainage will always tend to come through the wound. On three such occasions we have resected sufficient of the remains of the 10th, 11th, and 12th ribs to allow the lower part of the posterior chest wall to lie against the diaphragm, occlude the wound, and force the discharge through the tube. The mobile portion of chest wall has to be kept in place by firm strapping. The general result seemed satisfactory in all cases, though they needed careful nursing. This treatment should be combined with an apical tube, which would help pulmonary expansion and aid healing by the beneficial effects of washouts. Unfortunately, this was not used in any of these three cases, of which two came [illegible] our series and the other was done away from the [illegible] it was considered unwise to use anything but standard practice. As a result, pulmonary expansion was poor in all three.

(*b*) *Open sucking wound in mid-zone of chest.*—In these we perform some type of secondary suture, with or without a muscle flap, and treat the cases by drainage with two tubes. Considerable sepsis is likely in the wound, and uninterrupted primary union cannot be expected. One such case had a large defect in his chest wall to the right of the sternum, involving much costal cartilage on both sides. A large flap of pectoral muscle and skin had to be turned to close the defect, which healed up remarkably well. A straight posteroanterior radiogram 2 weeks later showed complete pulmonary expansion, although a sinus 8 in. long still existed.

(*c*) *Open sucking wound in upper zone.*—This is a group about which it is extremely difficult to be dogmatic. In cases which were relatively early, and in which the lungs showed signs of willingness to expand, with a small and not too dirty wound, we have been satisfied with secondary suture and insertion of an apical tube; but where the wound was more extensive and the pleura very heavily infected, with a rather large sucking wound, it has been found preferable to insert a posterior drain and a small tube through the wound. The small wound-tube was attached to an underwater drain, and also used for washouts in the same way as the apical tube. Cases in this group were apt to be very toxic, and the lung might have been expected to be in a massively collapsed state, from which expansion was likely to be delayed. Two cases have been treated by the small wound tube, and, as will be seen from the table, pulmonary collapse remained in one, but in the other a fair degree of pulmonary expansion was effected. In both it is considered that life was saved by the pleural washouts.

Fixing the wound tube.—A good seal must be made between the wound and the tube. Two procedures enable this to be effected. In the first, the size of the wound is reduced by sutures. In the second, the small tube is passed through a rubber disc such as is found in the top of saline bottles. The hole in the disc must be slightly smaller than the tube so that a tight fit is obtained. The disc is now strapped down on the wound, and a very good seal can be made. If any leakage does occur, the seal acts as a flap-valve so that air can only escape from the chest. The remarkable thing to us is that with this method, as well as with some of the incomplete secondary closures, pulmonary expansion could still occur.

Wound drainage-tube in other types of case.—Though not strictly in the confines of this paper, it may be mentioned that this same method of applying a small wound tube has also been used in cases of empyema not amounting to total pyothorax, in which there was an open sucking wound. The washouts are of great assistance in aiding pulmonary expansion and in reducing the pleural infection.

Thoracotomy without drainage.—Thoracotomy with thorough evacuation of all clot and closure of the chest has been used for cases of clotted hæmothorax, even when early infection is present. This has given satisfactory results, but it has not been thought advisable to treat established pyothorax in the same way, for fear of complicating the treatment without ultimately avoiding drainage. Our opinion has been strengthened by the satisfactory results of two-tube drainage, but a separate thoracotomy incision combined with drainage may have a place in the type of case which proved resistant to two-tube drainage. This course would make it possible to decorticate the lung, and if combined with two-tube drainage might be expected to improve the result. The method has been adopted in one patient, but the operation is too recent for the case to be included in this paper.

SUMMARY

The treatment of total and subtotal pyothoraces is discussed, from experience with 44 cases arising from war wounds.

Total pyothorax is mainly preventable, though a localised empyema is often unavoidable.

In cases of closed pyothorax aspiration is carried out for the first few days, penicillin being introduced into the pleura after aspiration on alternate days. A portion of the 9th or 10th rib is then resected, all clot removed,

and drainage instituted just under the lateral edge of erector spinæ. Breathing exercises are started at once.

A method of two tube drainage, with an additional apical tube, allows the cavity to be washed out and prevents the drain from becoming blocked.

A modification of the two-tube method has been adopted in some cases of open infected sucking wounds of the chest, under the name of "wound drainage tube."

TREATMENT OF RICKETS WITH SINGLE MASSIVE DOSES OF VITAMIN D_2

DAVID KRESTIN, M.D. LOND., M.R.C.P.

ALTHOUGH advanced degrees of rickets are now rarely
seen, the prevalence of a mild
was recently discussed by Corne
nurseries by Krestin (1944) B
ing results of prophylaxis by vitamin-D supplements given by the mothers. It is to be expected, therefore that the treatment of active rickets with daily doses of vitamin D would be equally disappointing if left to mothers who are careless or are pre-occupied with household or other duties, although the value of such treatment when given regularly and in adequate amounts is beyond doubt.

Vollmer (1939) and was successfully used in infants by Harnapp (1936, 1937, 1940). The clinical value of the method was largely confirmed, and it was found to be safe and reliable, by Schirmer (1939), Bischoff (1937), Bischoff and Brieger (1938), Braulke (1937), Windorfer (1938), and others in Germany, and by Vollmer (1939a and b) and Wolf (1943) in the United States

PRESENT INVESTIGATION

Treatment was carried out in a series of 83 infants
e residential and day
howed some degree of
of the lower ulnar
were made during the
autumn and winter months of 1943–44. The infants, who were all living under similar condition were
exa ion
In the
sin cm
of arachis oil was given in a teaspoon after a milk feed. All the infants took the oil readily, and in no instance in this series was it followed by vomiting, or by intestinal or other upset Thereafter a clinical examination was made at least once in 4 weeks, and a further radiogram of the wrist was taken 3 months after the administration of the vitamin; if healing was not complete by this time, the dose was repeated at the end of 6 months In a few instances radiograms were taken at shorter intervals, but owing to the distance of the nurseries from the X-ray
centre th outine. Biochemical
not practicable.
tion, no child in the
preparation, or was
The opportunities for
exposure to natural sunshine during this period were negligible.

Clinical signs of rickets can undoubtedly occur before typical changes appear in the radiogram of the lower ulnar epiphyses, and even without such changes appearing at any time, but only the infants showing X-ray changes were investigated, since, in the absence of biochemical examination of the blood, it is only by this means that the state of activity or of healing can be assessed For the purpose of this study the radiographic criteria of activity and healing generally described in standard works were accepted Two groups of infants were treated

(a) A *mild group*, in which the radiogram was characterised by fluffiness and fraying of the metaphyseal line These were given 7.5 mg (300 000 international units) of vitamin D_2 dissolved in 1 c cm of oil

(b) A *more severe group*, in which the X-ray changes were more advanced, in addition to the fluffiness, the metaphyses also showed cupping and broadening. These received 15 mg (600,000 IU) of vitamin D_2 dissolved in 2 c cm of oil

Although most of the infants in both these groups showed some clinical manifestations of the disorder, no case of really advanced disease, with such signs as joint swelling or gross deformity of the chest, are included in the series.

During the same period of observation and a similar period of the previous year two corresponding control groups of infants with active rickets living under the same conditions as those receiving the single dose were treated with daily supplements of vitamin D. The mild group were given the Ministry of Food cod-liver oil and
ived daily doses of a concen-
esults of this daily treatment
estin 1945b), but are included
As in the single-dose series, the results, like the initial diagnosis, are based on radiograms of the wrist.

RESULTS OF TREATMENT

(a) *Mild group* (table I) —Of 20 infants under one year treated with a single oral dose of 7.5 mg of the vitamin, 5 (25%) failed to heal.* Since this result is much less satisfactory than that obtained with adequate daily doses of cod-liver oil, which healed all of 32 cases, this amount of the vitamin must be considered inadequate, and cannot be recommended even for the mildest cases

TABLE I—TREATMENT OF RADIOLOGICALLY MILD ACTIVE RICKETS WITH DAILY DOSES OF COD LIVER OIL OR WITH SINGLE DOSES OF 7.5 MG. OF VITAMIN D_2 BY MOUTH

Dosage	Under 6 months			6–12 months			1 to 2 years		
	C	H	U	C	H	U	C	H	U
Daily dose of cod liver oil									
2 dr (1500 IU)	15	15	0	17	17	0			
3 dr (2100 IU)							5	4	1
4 dr (3000 IU)							4	4	0
Single dose of vitamin D_2 (7.5 mg = 300,000 IU)	5	4	1	15	11	4	12	11	1

C = cases, H, U = healed and unhealed

The results obtained with this dose in the 1–2 year age-group were good, 11 out of 12 cases being healed, but tendency to spontaneous healing may be greater at this age.

(b) *More severe group* (table II) —These all received single doses of 15 mg of vitamin D_2 (i.e., 600,000 IU) Of 38 infants under one year only 4 (10.5%) failed to heal after 3 months Each of these was then given a second dose of 15 mg. and satisfactory healing resulted in all. Of 13 children between 1 and 2 years given a single dose of 600,000 IU all were completely healed by the end of 6 months Thus this dose may be regarded as having a definite therapeutic value, but since the results are less satisfactory than those obtained by giving regular daily amounts of 3250 IU of vitamin D, massive dosage can only be recommended where regular administration is impracticable or otherwise contraindicated

TABLE II—TREATMENT OF RADIOLOGICALLY MORE SEVERE ACTIVE RICKETS WITH DAILY DOSES OF A CONCENTRATED VITAMIN-D PREPARATION, OR WITH SINGLE DOSES OF 15 MG (600,000 IU) OF VITAMIN D_2 BY MOUTH

Dosage	Under 6 months			6–12 months			1 to 2 years		
	C	H	U	C	H	U	C	H	U
Daily dose of vitamin D, 3250 IU	12	12	0	11	11	0	16	16	[illegible]
Single dose of vitamin D_2 (15 mg. = 600,000 IU)	21	18	3	17	16	1	13	13	[illegible]

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* Of a group of 6 infants in the same age-group who were given single doses of 7.5 mg in [illegible] 1944, and watched [illegible] during a wet sunless summer, 3 failed to heal [illegible] autumn

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It will be noticed that 2 patients died with an apical tube, in spite of satisfactory pulmonary expansion. One of these was a German, in whom the hazards of the battle had caused a delay of 10 days before any treatment could be instituted for a severe sucking wound. He was terribly ill and completely mentally deranged on admission, and it was remarkable that he was kept alive for 8 days, and, for a time, gave hope that he might survive. The other patient was also a German, who, *although progressing satisfactorily, died after a severe* secondary hæmorrhage from an extensive defect of the anterior chest wall.

The 4 cases which did not show satisfactory pulmonary expansion demonstrate the limitations of this method. Two of these were Germans who had previously been treated by drainage, and had to be redrained on arrival at the unit. This bears out what has already been said about the importance of the early period after drainage. In these two, this valuable time had been wasted by the previous treatment in German institutions. Of the other two, in one the lung was noted to be very rigid at the time of drainage, and in the other a radiogram showed a completely black collapse of the affected lung. It is not felt that a satisfactory solution to this type of case has been found. It is interesting to note that bronchial fistula did not prove a serious obstacle to pulmonary re-expansion.

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DAVID KRESTIN, MD LOND, MRCP

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Vollmer (1939) and was successfully used in infants by Harnapp (1936, 1937, 1940) The clinical value of the method was largely confirmed, and it was found to be safe and reliable, by Schumer (1939), Bischoff (1937), Bischoff and Brieger (1938), Braulke (1937), Windorfer (1938), and others in Germany, and by Vollmer (1939a and b) and Wolf (1943) in the United States

PRESENT INVESTIGATION

Treatment was carried out in a series of 83 infants under 2 years of age attending the residential and day war time nurseries in Preston who showed some degree of active rickets in the radiograms of the lower ulnar epiphyses The observations were made during the autumn and winter months of 1943–44 The infants, who were all living under similar conditions, were examined clinically and by X rays soon after admission In those showing positive changes in the radiogram, the single massive dose of vitamin D_2 dissolved in 1 or 2 c cm of arachis oil was given in a teaspoon after a milk feed All the infants took the oil readily, and in no instance in this series was it followed by vomiting, or by intestinal or other upset Thereafter a clinical examination was

dose was repeated at the end of 6 months In a few instances radiograms were taken at shorter intervals, but owing to the distance of the nurseries from the X ray centre this was not possible as a routine Biochemical investigations were unfortunately not practicable

Throughout the period of observation, no child in the series received any other vitamin D preparation, or was exposed to ultraviolet radiation The opportunities for exposure to natural sunshine during this period were negligible

Clinical signs of rickets can undoubtedly occur before typical changes appear in the radiogram of the lower ulnar epiphyses, and even without such changes appearing at any time, but only the infants showing X ray changes were investigated since, in the absence of biochemical examination of the blood, it is only by this means that the state of activity or of healing can be assessed For the purpose of this study the radiographic criteria of activity and healing generally described in standard works were accepted Two groups of infants were treated

(a) A *mild group* in which the radiogram was characterised by fluffiness and fraying of the metaphyseal line These were given 7 5 mg (300 000 international units) of vitamin D_2 dissolved in 1 c cm of oil

(b) A *more severe group* in which the X ray changes were more advanced in addition to the fluffiness the metaphyses also showed cupping and broadening These received 15 mg (600,000 IU) of vitamin D_2 dissolved in 2 c cm of oil

both these groups

of the disorder, no

such signs as joint

rest, are included in

the series

During the same period of observation and a similar period of the previous year two corresponding control group

cts living under the same

the single dose were treate

vitamin D The mild group were given the Ministry of Food cod-liver oil and the more severe group received daily doses of a concentrated preparation The results of this daily treatment are discussed elsewhere (Krestin 1945b), but are included in the tables for comparison As in the single dose series, the results, like the initial diagnosis, are based on radiograms of the wrist

RESULTS OF TREATMENT

(a) *Mild group* (table I) —Of 20 infants under one year treated with a single oral dose of 7 5 mg of the vitamin, 5 (25%) failed to heal * Since this result is much less

TABLE I—TREATMENT OF RADIOLOGICALLY MILD ACTIVE RICKETS WITH DAILY DOSES OF COD LIVER OIL OR WITH SINGLE DOSES OF 7 5 MG OF VITAMIN D_2 BY MOUTH

Dosage	Under 6 months			6 12 months			1 to 2 years		
	C	H	U	C	H	U	C	H	U
Daily dose of cod liver oil									
2 dr (1500 IU)	15	15	0	17	17	0			
3 dr (100 IU)							5	4	1
4 dr (3000 IU)							4	4	0
Single dose of vitamin D_2 (7 5 mg = 300 000 IU)	5	4	1	15	11	4	12	11	1

C = cases, H, U = healed and unhealed

satisfactory than that obtained with adequate daily

ases, this

dequate,

cases

year age

group were good, 11 out of 12 cases being healed but tendency to spontaneous healing may be greater at this age

(b) *More severe group* (table II) —These all received single doses of 15 mg of vitamin D_2 (i e 600,000 IU) Of 38 infants under one year only 4 (10 5%) failed to heal

TABLE II—TREATMENT OF RADIOLOGICALLY MORE SEVERE ACTIVE RICKETS WITH DAILY DOSES OF A CONCENTRATED VITAMIN D PREPARATION, OR WITH SINGLE DOSES OF 15 MG (600 000 IU) OF VITAMIN D_2 BY MOUTH

Dosage	Under 6 months			6 12 months			1 to 2 years		
	C	H	U	C	H	U	C	H	U
Daily dose of vitamin D, 3250 IU	12	12	0	11	11	0	16	16	0
Single dose of vitamin D_2 (15 mg = 600,000 IU)	21	18	3	17	16	1	13	13	0

after 3 months Each of these was then given a second dose of 15 mg and satisfactory healing resulted in all Of 13 children between 1 and 2 years given a single dose of 600 000 IU all were completely healed by the end of 6 months Thus this dose may be regarded as having a definite therapeutic value but since the results are less satisfactory than those obtained by giving regular daily amounts of 3250 IU of vitamin D, massive dosage can only be recommended where regular administration is impracticable or otherwise contra indicated

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* Of a group of 6 infants in the same age group who were given single doses of 7 5 mg in April 1944 and watched [illegible] a wet sunless summer 3 failed to [illegible] again

GENERAL PROGRESS AND SUSCEPTIBILITY TO INFECTION

Though the infants treated by the large single dose of vitamin D seemed to thrive and to improve in health, they were deprived of the extra fat contained in the daily cod-liver oil, and of the regular supplements of vitamin A which both the cod-liver oil and the concentrated preparation provided. It was therefore considered desirable to compare gain in height and weight, and the susceptibility to infection in all groups under treatment.

Records of height, weight, and days of illness due to infection were kept on special charts. Though the numbers in each group were too small to have much statistical significance, there was no evidence that the infants receiving single massive doses of vitamin D suffered any obvious disadvantage compared with those receiving daily cod-liver oil or concentrated preparations containing vitamin A.

Obvious vitamin-A deficiency was not observed in any of the subjects of this investigation, either on admission or during the period of observation; where evidence of such a deficiency coexists with rickets, the daily administration of a preparation containing vitamin A would be indicated. All infants received the Ministry of Food orange juice daily.

DISCUSSION

Failure to heal.—Windorfer (1938) and Harnapp (1936) found that over 90% of the vitamin D administered as a single large dose by mouth was normally absorbed. Although loss from vomiting or diarrhœa could be excluded in the present series, inability to absorb an adequate proportion of the vitamin from the bowel owing to some temporary or local unfavourable conditions seems possible. There is evidence that the vehicle in which the vitamin is administered can influence the extent to which it is absorbed and becomes effective. Thus Lewis (1935, 1936, 1939), Eliot et al. (1936), and Shelling (1937) showed that both calciferol and fish-liver oils were more effective when dispersed as an emulsion in milk. Although the doses in this investigation were not given as an emulsion, they were usually given immediately after a milk feed, though this was not always possible. In future work on the value of the single-dose method it would be worth comparing the results obtained by giving the vitamin as an emulsion in a milk feed.

In the present state of our knowledge, however, other factors may have to be considered. Thus it is known that large doses of this vitamin given by mouth will raise its level in the plasma (Warkany 1936) and that it may be stored in the liver and other organs for as long as 12 weeks (Heymann 1937). The effectiveness of the dose given may therefore depend on the amount of vitamin already present in these organs at the time of treatment, as well as on temporary variations in the capacity of the organs for storing it.

Rate of healing.—It was not practicable to repeat X-ray examinations at short intervals, so the rate of healing could not be established accurately in the present series, but other observers have found that healing is more rapid than with the usual daily administration. Thus Harnapp (1937, 1940) found that low figures for serum calcium and phosphorus returned to normal in 48–60 hours. This was confirmed by Vollmer (1939b), who also found that in 2 cases with tetany, convulsions and muscular irritability disappeared within 2 days. Signs of healing in the radiograms have been observed by Harnapp (1936), Brieger (1939), and Turk (1940) within as short a time as 8 or 9 days, and complete healing within an average of 34 days after the dose was given.

In the present investigation general improvement was noted in most of the infants within a few days of their receiving the vitamin, but physical signs gave little indication of the progress of the disease. Harnapp (1940) reported that craniotabes disappeared in 8–10 days, but in the present series the time taken varied considerably; the average time was 3 weeks, but in some cases it was as much as 6 weeks. If, therefore, the rate at which cranial softening disappears can be accepted as a guide, the claim that healing is greatly accelerated by this method of treatment needs further investigation. It should be noted however that in these nurseries the disappearance of craniotabes when the child is about 6 months old was not always associated with radiological evidence of healing. Moreover, the progress of dentition and the rate of closure of the anterior fontanelle, though by no means constantly retarded in the mild or early type of rickets under consideration, seemed slower after the single massive dose than after regular daily supplements of antirachitic vitamin. Definite proof of this was difficult to obtain.

Toxic manifestations.—The complete absence of any immediate or remote undesirable manifestations has already been noted. Vitamin-D toxicity has been discussed elsewhere (Krestin 1945a), and it will suffice to say that calciferol when given in the pure form, will not produce toxic manifestations until over 2,000,000 IU has been given. Thus the amounts used for the single dose method, even when repeated once, are well within the margin of safety.

Indications for the method.—The simplicity and safety of the single dose method, and its saving in time, trouble, and material, may commend it, particularly where large numbers of children have to be treated. Since, however, the results obtained by daily administration were somewhat better this older method must still be the one of choice where adequate and regular dosage can be assured. The chief indication for the single dose would be for infants who cannot be watched daily by trained personnel and whose mothers or guardians could not be relied on to give the daily oil regularly or in adequate doses. In such cases the large single dose could be given by a nurse at the child's first attendance at an outpatient clinic or welfare centre, after which a second attendance for radiographic examination 3 months later should be insisted on. If at this examination healing was not complete, a second dose of 15 mg. of vitamin D_2 should be given.

The single dose method would also be an advantage where the daily administration of oil is difficult or otherwise contra-indicated. Thus in the Preston nurseries it was found that large enough doses of cod-liver oil could not be given to about 2 or 3% of infants under 6 months of age, because it was either rejected or caused gastro-intestinal disturbance. In a somewhat larger but undetermined percentage of older children the oil produced troublesome skin rashes. In some of these the difficulty could be overcome by the daily use of more concentrated preparations, but these are more expensive. The rapid relief of tetany after a massive single dose of vitamin D_2 has already been mentioned, and it would also be an advantage in infants suffering from acute pulmonary infections if the claims that bony calcification proceeds more quickly could be substantiated.

SUMMARY

A series of 83 infants under 2 years of age with active rickets, as determined by the radiological appearances of the lower ulnar epiphyses, were treated by single massive doses of vitamin D_2 given by mouth, and the results compared with other groups of infants who received daily supplements of the Ministry of Food cod-liver oil or other vitamin-D preparation.

Those with slight or early radiological changes were given 7·5 mg., or 300,000 IU. Results in infants under a year old were unsatisfactory compared with those treated with daily cod-liver oil, and this dose was therefore considered to be insufficient for any type of active rickets.

A series with more severe or advanced radiological changes were given 15 mg., or 600,000 IU. Results, though not as satisfactory as those obtained with 3250 IU of vitamin D daily, showed the method to be sufficiently reliable to merit a place in antirachitic therapy.

As regards gain in height and weight and susceptibility to infection, the infants receiving a single dose of vitamin D but no vitamin A showed no serious disadvantage over those who received daily preparations containing both these vitamins.

The procedure is simple, safe, free from toxic manifestations, and economical.

It will prove useful where daily dosage is impracticable, unreliable, or upsetting to the patient.

I wish to record my gratitude to the late Dr. F. A. Sharpe, medical officer of health for Preston, for making this investigation possible, and for his constant interest and encouragement.

My thanks are also due to Miss P. Wright and the matrons of the nurseries for their cooperation; to Dr. J. Laurie, Sharoe Green Hospital, for X-ray facilities; and to Messrs. Glaxo Limited for supplies of the vitamin preparation used.

References at foot of opposite page

BLOOD ACID PHOSPHATASE IN PROSTATIC CANCER

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of œstrogen may not only make the patient uncomfortable but, if animal experiments are anything to go by, may do him harm (Horning and Dmochowski 1944).

The group of substances which we call "phosphatase" are enzymes—i.e., they act as catalysts in the liberation of phosphoric acid from organic phosphoric esters present in large amounts in the human body. Their reactivity is maximal at two well-defined ranges of hydrogen-ion concentration, one "alkaline" and the other "acid." Acid phosphatase is most active about pH 4·9. Its activity is inhibited by any trace of fluoride but not appreciably affected by small amounts of soluble oxalates. It is mainly elaborated by adult prostatic glandular epithelium, in which it is about 300 times more concentrated than in any other human tissue. It is

does reduce the rate of growth

sue is well shown by Schenkin

said to be vestigially female, so that œstrogen in this case will theoretically increase the size of the gland and aggravate the condition (see Answers to Questions, *Brit. med. J.* 1944 i, 737).

SIGNIFICANCE OF ACID PHOSPHATASE LEVELS

For the estimation of acid phosphatase 10 c.cm. of blood is collected from a vein, using a minimum of pressure with the tourniquet. It is then immediately run into a 30 c.cm. screw-capped vial containing 20 mg. of dry solid potassium oxalate (0·2 c.cm. of 10% potassium oxalate run into a vial and completely dried in a hot oven; these vials may be prepared in quantity since they keep indefinitely). After a few minutes' standing or definitely within an hour the plasma is removed by centrifugalisation. If desired, fresh serum may be taken instead. The quantities used and normal values are the same in each case. Once the plasma or serum has been separated, the acid phosphatase can be estimated at leisure during the next 8–10 hours, for it changes very little in this time (Wray, unpublished). The technique of estimation has been adequately described by King et al. (1942), Watkinson et al. (1944), and Elcoate (1944).

The values obtained, in acid phosphatase units, are as follows:

0–3·5 units: normal male or female.

3·5–5 units: significant only if there are clinical reasons for suspecting prostatic carcinoma; suggestive but sometimes found in other conditions.

5–10 units: strongly suggests prostatic carcinoma.

Above 10 units: diagnostic of prostatic carcinoma.

Very occasionally readings up to 10 units are given in cases of jaundice, hyperparathyroidism, osteitis deformans, and bone secondaries due to growths other than in the prostate, but none of these has yet been found to give a value higher than 10 units. The normal acid phosphatase value depends on many factors in the body but probably the prostatic tissue plays a large part in deciding the level. A gross increase in acid phosphatase is always due to malignant prostatic tissue and almost certainly indicates the presence of secondary deposits, especially in bone. It cannot be too strongly stressed however that a normal reading may on rare occasions be obtained

so the amount of acid phosphatase produced is small. A further factor which must be remembered when assessing the result is the temperature of the patient at the time of taking the blood. If this is above normal no serial comparison can be made because fever temporarily and irregularly reduces the blood phosphatase level if it has been abnormally raised (Huggins et al. 1941).

PRESENT SERIES

Acid phosphatase estimation is now undertaken as a routine procedure in these laboratories; many hundreds have been performed in the past two years. The highest values we have found, apart from prostatic cancer, have been 3·6 units in a case of catarrhal jaundice, 3·1 units in an advanced case of osteitis deformans, and 3·5 units

bone secondaries.

se was 81·1 units.

lied 13 new cases

ection from these

se estimation can

diagnosis and in

ment.

examination with prostatic palpation and X ray will usually arouse suspicion of a malignant prostate even if it does not permit a firm diagnosis; but there are many cases in which the picture is not clear-cut. Experience suggests that early diagnosis and treatment helps the patient to a more speedy relief.

CASE 1.—Aged 66. Rheumatic pains for many years in limbs, for which he had frequent sick-leave. In May, 1943, slipped on stairs at home; said to have pain in left hip since.

accident was said to be

enlarged, but not hard.

accordingly. First seen

n in left hip with recent

Prostate firm, regular,

on direct questioning was there any suggestion of difficulty of micturition. Hæmoglobin 11·2 g. per 100 c.cm., red cells 5·1 million per c.mm., sedimentation-rate 11 (Spa method, normals 0–15; Collins et al. 1939), acid phosphatase 11·0 units, alkaline phosphatase 31 units. Diagnosed on these results as prostatic carcinoma. X ray showed (?) secondaries in pelvis. Given stilbœstrol 2 mg. b.d. for 6 days, then 10 mg. daily. In 5 days the acid phosphatase fell to 5 units and then in the next 2 weeks to 3 units. There was the usual slight initial rise in the alkaline phosphatase of 34 to 38 units. Within a week there was considerable clinical improvement. The leg became normal within 3 weeks. When last seen (June 20, 1944) the patient was very fit and after a long tram journey had walked 1½ miles for consultation. Hb. 15·4 g. per 100 c.cm. red cells 6·1 million per c.mm., acid phosphatase 1·5 units, alkaline phosphatase 12·8 units. During the past few weeks the patient had complained of variable but at times severe breast tenderness. There had been no giddiness or vomiting. It was recommended that the stilbœstrol dosage be reduced to 3 mg. daily.

DR. KRESTIN: REFERENCES

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CASE 2.—Aged 73. When first seen had paraplegia with severe bone pains. He was very irritable and caused considerable trouble to the nurses in the ward. Findings in nervous system suggested spinal lesion about lower thoracic or upper lumbar region. Prostate was hard, fixed, and had an irregular surface. There had been frequency for some years with pain on micturition recently, and some loss in weight during the past few months. Lumbar puncture gave slightly yellow fluid: Wassermann reaction negative, chloride 0·70%, sugar 0·085%, protein 0·7%, globulin + +, no pus. Pressure fell quickly on tapping with little alteration on jugular compression, indicative of spinal block. Blood-urea 59 mg. per 100 c.cm., Hb. 14·0 g. per 100 c.cm., red cells 6·5 million per c.mm. Too ill to be disturbed for X ray. Acid phosphatase 248 units, alkaline phosphatase 14·8 units. Diagnosed as prostatic cancer with bone secondaries, including one in spine causing spinal compression. Started stilbœstrol 1 mg. t.d.s. first day, 2 mg. t.d.s. 2nd day, 5 mg. t.d.s. 3rd day, and continued on this dose. Within 48 hours of commencement of treatment the acid phosphatase was reduced to 9·6 units and the alkaline phosphatase was slightly raised to 16·9 units. There was a striking improvement in the patient's temperament and well-being. Within 8 weeks he had good movement of legs and ankles and while not able to stand could take light weight on his legs. Four months after commencing treatment he developed extensive phlebitis of the left saphenous vein. On treatment this cleared in a further 4 weeks. Five months after commencing treatment he returned home feeling considerably improved and able to walk with sticks, but there was some œdema of both legs.

CASE 3.—Aged 73. Painter and decorater. In February, 1943, complained of pain and swelling of right hand and wrist, not improved by massage and heat. Progressive anæmia for 9 months. Breathless on exertion. Diarrhœa recently. Feb. 10, 1943: Hb. 7·7 g. per 100 c.cm., red cells 3·3 million per c.mm., white cells 17,000 per c.mm. (polymorphs 48%, lymphocytes 48%, granular basophils 515 per million red cells). Chronic lead poisoning suspected but no lead in urine (Fairhall's method), either before or after ammonium chloride therapy. The blood improved on iron and vitamin C. Feb. 27: Hb. 9·1 g. per 100 c.cm., red cells 4·0 million per c.mm., white cells 20,000 per c.mm. (polymorphs 32%, lymphocytes 63%). At this stage the possibility of a chronic lymphatic leukæmia had been suggested. First seen here on Dec. 7, 1943: very ill; Hb. 7·0 g. per 100 c.cm., red cells 2·7 million per c.mm., white cells 23,000 per c.mm. (polymorphs 62%, lymphocytes 32%), normoblasts 90 per million reds, reticulocytes 4·6%, Van den Berg normal. There was therefore a well-established blood regeneration but it was not yet equal to the destructive process at work. Clinically no gross abnormality could be found. The prostate was not enlarged, and its surface was smooth, but X ray of pelvis showed numerous secondary deposits. Dec. 9: acid phosphatase 4·0 units, alkaline phosphatase 37·8 units. Carcinoma of prostate was suggested and stilbœstrol therapy started, but the patient was in a poor way and died some days later. At autopsy the prostate was of normal size, for the most part soft, but one nodule was firm and of different texture. Histologically it was an adenocarcinoma. If this man had not been so desperately ill when first seen he would have been al subject on whom to try the testosterone stimulation ed below.

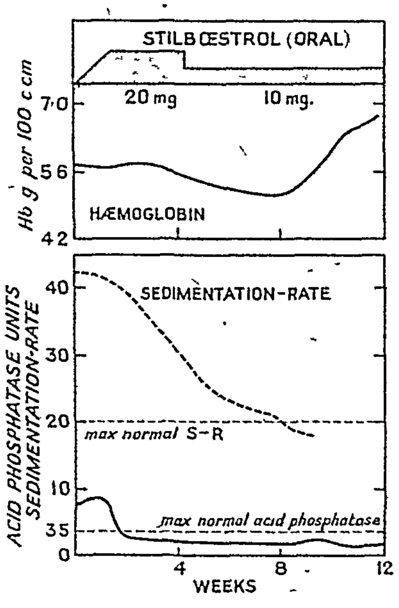

Fig. 1—Case 4. The hæmoglobin begins to rise about the 8th week, when the sedimentation-rate and acid phosphatase are nearly normal. Some anti-anæmia treatment had been given throughout.

ntrol.—In most cases of prostatic cancer where sphatase is raised the administration of stilbœstrol by mouth, even in very small doses, causes a dramatic fall in the acid phosphatase level and a variable but temporary increase in the alkaline phosphatase. Later, providing the dosage is adequate, the acid phosphatase rapidly returns to normal and the alkaline phosphatase more slowly. The sedimentation-rate is an important observation, for, at first it is raised but as the general condition improves it gradually falls to normal. The hæmoglobin may be either normal or deficient. When anæmia is present it seems to be progressive in spite of iron, liver, and transfusions. But when the acid phosphatase and sedimentation-rate are almost within normal limits, whether or not intensive treatment is given for the anæmia, the hæmoglobin and red-cell figures improve. It seems therefore that the factor responsible for the anæmia in prostatic cancer is removed or neutralised when the acid phosphatase and sedimentation-rate reach normal limits. One of the first principles of treatment therefore should be to bring these values to normal while maintaining the blood in the best possible condition until this is done. Two cases will illustrate this principle.

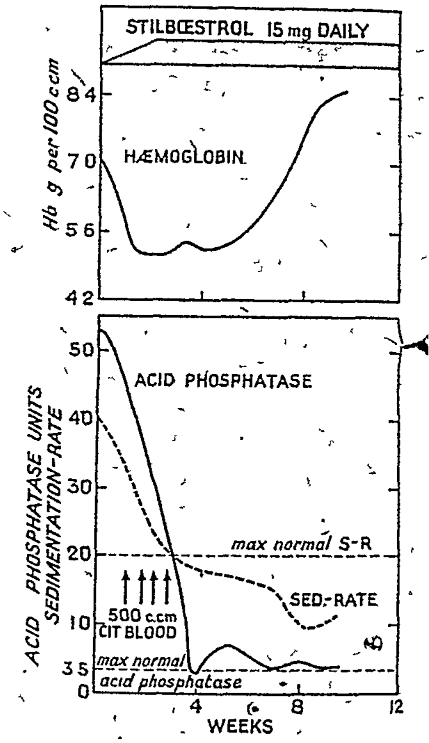

Fig. 2—Case 5. It was necessary to give repeated blood-transfusions in the early stages even to maintain the hæmoglobin level, but when the acid phosphatase and sedimentation-rate became normal the hæmoglobin increased progressively.

CASE 4.—Aged 71. Extreme urgency on micturition, with great frequency for 12 months. Much persistent pain in lower abdomen for 6 weeks, becoming worse, but no pain on micturition. Constipated. Prostate enlarged, stony hard surface irregular. X ray showed secondaries in pelvic bones. Hb. 11·9 g. per 100 c.cm., red cells 4·9 million per c.mm., white cells 17,000 per c.mm. (polymorphs 75%) SR 43 (Spa method), much raised. Acid phosphatase 6·4 units, alkaline phosphatase 37·2 units. Stilbœstrol given in increasing doses until at the end of a week the patient was receiving 20 mg. a day. This was maintained until he complained of severe breast pains, when it was reduced to 10 mg. a day (fig. 1). When last seen patient was very fit apart from slight frequency of micturition, but there was now no pain. Appetite good, bowels still slightly constipated but improving. The same dose of iron and vitamin C had been administered throughout but it was not until the acid phosphatase and sedimentation-rate came within approximately normal limits that the hæmoglobin started to increase.

CASE 5.—Aged 54. Pain in lower part of back and thighs for some months. Considerable frequency and difficulty on micturition. Prostate hard, craggy, fixed. X ray revealed pelvic secondaries. Hb. 7·4 g. per 100 c.cm., SR 39 (Spa method), acid phosphatase 62 units, alkaline phosphatase 170 units. Given gradually increasing doses of stilbœstrol, working up to 15 mg. daily within a week. The sedimentation-rate and acid phosphatase fell. It was necessary to give repeated blood-transfusions to maintain the hæmoglobin. In spite of the apparent blood destruction there was no jaundice. The patient continued to feel very poorly until the sedimentation-rate and acid phosphatase were within normal limits; then, with no blood-transfusions whatever, the hæmoglobin gradually rose (fig. 2) and the patient felt much better. As far as we know this man is still on 15 mg. daily, but we could not follow his further progress because he left the district.

Testosterone stimulation test.—Huggins and Hodges (1941) have shown that injections of testosterone propionate cause a rise in the acid phosphatase level in cases with bone secondaries due to prostatic cancer. This is an excellent help in the differentiation of a malignant prostate with secondaries from a benign hyperplasia. The dose suggested is 25 mg. of testosterone propionate intramuscularly daily for 15 days. During this time the patient should be kept under close observation and should have blood acid phosphatase estimations done at least every [illegible] is benign there is no increase; [illegible] appreciable. Apparently the o[illegible] the test is that large doses of the androgen should not be injected into those with hypertension. We have had no ill effects so far in our cases. On the contrary, case 6 improved slightly both in general well-being and also in ordinary symptoms.

CASE 6.—Aged 70. Long history of difficulty of micturition. Some pain in lower back recently. Bladder distension (1943), prostate enlarged but regular, firm consistency. X ray of pelvis showed some patchy decalcification, possibly due to secondaries. Refused operation. July 15, 1943: admitted with acute retention. Suprapubic intubation. After considerable difficulty with drainage a satisfactory flow was eventually obtained. Again patient refused to have any further treatment. Seen again on April 18, 1944: Hb. 14·7 g. per 100 c cm, red cells 6 million per c.mm., white cells 12,000 per c.mm (polymorphs 61%) Repeated examinations of blood phosphatase showed acid to be around 2·5 units and alkaline phosphatase to be 10 3 units with slight variations. In an attempt to decide whether this lesion was simple or malignant the patient was again admitted to have testosterone injections. In view of his age and length of history the amount of hormone given by intramuscular injection was reduced to 10 mg. on alternate days. During this time the acid phosphatase on no occasion exceeded 3 3 units—i.e., there was no appreciable rise. During the course of injections, and for some time afterwards, the flow of urine through the urethra was much improved. The patient felt much better in himself. There was therefore no evidence from the test of secondary malignant deposits arising from the prostate. In support of this there has been no appreciable change for the worse in the patient's condition during the past 7 months, in fact the urine symptoms are improving. His weight is constant and appetite good. His only complaint is a little pain in the right leg.

SUMMARY

[illegible] f blood acid phosphatase est[illegible] id to diagnosis and as a [illegible] l treatment of prostatic cancer.

The testosterone propionate stimulation test is a useful aid in the differentiation of malignant prostate from benign hyperplasia.

In cases of prostatic cancer showing anæmia, the sedimentation-rate and acid phosphatase must fall to within normal limits before a rise in the hæmoglobin can be expected.

I am indebted to the many doctors who have allowed me access to their cases during these investigations, and also to Mr. S F. Elcoate for help with the technical side and Mr. M Gibson for help with the graphs and other details.

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DURING his visit to Sweden, Sir Howard Florey, FRS, was presented with the Berzelius medal in silver

Boots Pure-Drug Company has given the diabetic department of King's College Hospital an annual endowment of £1000 for seven years to provide research scholarships in diabetes and allied diseases

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PENICILLIN-SENSITIVITY OF *HÆMOPHILUS INFLUENZÆ*

TWO SENSITIVE PATHOGENIC STRAINS

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IN his original description of penicillin Fleming (1929) recorded that *Hæmophilus influenzæ* (Pfeiffer's bacillus) was insensitive to the drug, while the same author and Maclean (1930) confirmed this fact and employed the drug to inhibit the growth of other organisms when isolating the delicate hæmophilus from such situations as the upper respiratory tract. Later Maclean (1937) applied the method to the isolation of *H. pertussis* on cough plates.

However, Pittman (1931) had pointed out that *H. influenzæ* could be divided into two classes, a smooth (S) and a rough (R). S strains were isolated from cases of meningitis and other sites where they were obviously pathogenic, while the R strains occurred mainly as saprophytes. "S–R degeneration" took place readily. By cross-agglutination methods Pittman divided S strains into two serologically distinct types which she called (*a*) and (*b*), and later (1933) showed that the majority of strains from cases of meningitis belonged to the (*b*) type. Six serological types have since come to be recognised. *R* strains have proved to be serologically heterogeneous and have never been so classified with success.

Recently, two cases of *H. influenzæ* meningitis have been under the care of one of us (P. F.), and the organisms have been isolated (R. E. R.) and investigated (R. I. H. and R. E. R.). Both strains were smooth and belonged to type (*b*). Both were sensitive to penicillin and sulphadiazine. The first case recovered rapidly on administration of the drugs, but unfortunately the second was in extremis on admission to hospital and died before adequate treatment could be started.

CASE-REPORTS

CASE 1.—A boy, aged 2½ years, was admitted to hospital in January, 1945, with a diagnosis of meningitis. He had been very well until six days before, when he developed nasal catarrh and complained of earache. During the following days he had [illegible] *to have a trivial* cold, but on [illegible] ore admission he vomited, an[illegible] his temperature 103·4° F and noticed stiffness of his neck. Although the temperature had settled to 98·7° on the day before admission, the neck rigidity became more pronounced, and during the night the child's condition deteriorated so rapidly that he was sent into hospital next morning.

He was drowsy when he arrived and resented being disturbed. The neck was rigid, with the head fully extended, and [illegible] were seen in the skin. Lumbar puncture produced fluid under a pressure of 350 mm., containing many pus cells but no micro-organisms. Intramuscular injections of penicillin were started at once and repeated every three hours. He received 30,000 units every 24 hours. By next morning he was less somnolent, his head retraction had become less definite, and his temperature had fallen from 103° to 101·2°. Although it was then known that the cerebrospinal fluid incubated overnight and a culture had both grown *H. influenzæ*, in view of the striking improvement it was decided to continue treatment with penicillin in the same dosage. To provide a second line of defence, sulphadiazine 1·5 g. was then given, followed by 1 g. four hourly.

The improvement in the child's condition was rapid and uninterrupted. Next day he was conscious and 24 hours later he began to talk sensibly. Although the temperature remained just above 99° for another four days, the head-retracti[illegible] d the child's behavio[illegible] and sulpha-diazine [illegible] Cerebrospinal fluid (CSF) taken on the twelfth day after admission showed neither cells nor micro-organisms and the culture remained sterile after 48 hours. The child was kept under observation for another twelve days, but remained apyrexial and perfectly well.

CASE 2.—A twelve-months-old boy was sent to us in February, 1945, with a history of three-weeks' poor health followed by a dramatic change for the worse two hours before admission. During the middle of January he had contracted acute bronchitis, which cleared up after a few days' treatment with a sulphonamide. Since then he had been fretful and did not take his feeds well, but for the last few days he had seemed better than usual.

At 1 PM on the day of admission he vomited, and became unconscious soon afterwards. When seen at 3 PM he was pale, cold, and deeply comatose, with a temperature of 98° and a pulse-rate of 136 per min. The classical signs of meningitis were lacking, except for a doubtful Kernig's sign, but he had a right external rectus palsy and his pupils were unequal. As in the previous case the throat was red and the tonsils were covered with a loose yellowish patchy exudate. The CSF was opalescent and under a pressure of 250 mm.; culture yielded a pure growth of *H. influenzæ*. Intramuscular injections of penicillin were begun immediately and repeated every three hours, aiming at a dosage of 30,000 units in 24 hours. He was also given an initial dose of sulphamezathine 1 g., followed by 0·5 g. four-hourly. His condition, however, deteriorated rapidly and he died at 1.30 AM, almost exactly 12 hours after the onset of symptoms.

Necropsy was unfortunately delayed for five days by administrative difficulties. The whole surface of the brain, especially at the base, was found to be covered with thick greenish-yellow pus. There was great excess of CSF, with some distension of the lateral ventricles. No abnormality was found elsewhere. *H. influenzæ* could no longer be isolated from meninges or respiratory tract.

BACTERIOLOGY

Both the organisms were gram-negative cocco-bacilli with many filamentous forms. Both grew on blood agar, chocolate agar, and pepsinised blood agar, but not on simple agar or serum agar, even when the latter was first seeded with staphylococci. The colonies were smooth. Both produced indole and of the usual range of sugars fermented only glucose. Both belonged to Pittman type (*b*). They were thus typical S strains of *H. influenzæ*. That from case 1 was the more virulent to mice, killing all of three animals in 24 hours after injection; the other took 48 hours to do this. Both were sensitive to penicillin to about the same degree as the standard Oxford strain of staphylococcus. They were also sensitive to sulphadiazine.

DISCUSSION

H. influenzæ is an important cause of meningitis in general hospital practice, especially in children under two years where the bactericidal power of the blood for this organism is negligible (Fothergill and Wright 1938). In North America, Ward and Fothergill (1932) found it to occur in 25 out of 184 cases of meningitis in children under two years, while Fothergill (1937) found it responsible in 51 out of 201 cases at another hospital. In England it has been found in 3 out of 34 cases in the last two years at the Hospital for Sick Children, Great Ormond Street (Bodian, personal communication). In infants the untreated disease is almost invariably fatal; in adults and older children the prognosis is better (see Mutch 1941).

Previously two lines of treatment have been attempted. The first is by specific antiserum prepared by immunising horses or rabbits either with the whole organism or with culture filtrates (Parker 1919 and others). This was tried on a monkey with success by Wollstein in 1911 (quoted by Ward and Fothergill 1938) and reintroduced by Pittman (1933) and others. Several series treated with such sera have been reported—e.g., Ward and Fothergill (1932) and Fothergill (1937). Complement has to be added to the CSF, and most cases die even if the fluid becomes sterile for a time, because pockets of infection become walled off, later to break down and cause reinfection of the meninges.

Much more success has been obtained with the [illegible] Pittman (1942) first showed that most [illegible]c strains were sensitive in some degree to these drugs and that sulphadiazine was the most effective in controlling experimental infections in mice. Sako (1944) has obtained 17 recoveries in 23 cases using this drug, a recovery-rate of 74%. These encouraging results were obtained by the use of large doses in the earliest stages and the prognosis is still bad in very young infants. Sulphapyridine has been used also, but with varying degrees of success—e.g., Aleman (1941) and Gordon, Woodcock, and Zinnemann (1944). Pittman found this drug not to be very effective in vitro.

Sensitivity of the organisms to penicillin does not seem to have been observed before. Further experiments are necessary to determine whether or not this applies to the majority of type (*b*) strains. Case 1 responded in such a striking manner to penicillin alone that we would urge others to try this drug on their own cases in combination with sulphadiazine. Such combined therapy has already been recommended for pneumococcal meningitis and shown to be more effective then either drug used separately (Waring and Smith 1944). Indeed all the common types of meningitis except the tuberculous might respond best to this treatment.

SUMMARY

Two cases of influenzal meningitis are described, in both of which the organism was of the smooth type and belonged to Pittman type (*b*).

Both organisms were sensitive to penicillin and sulphadiazine. This is in striking contrast to the penicillin-resistance of the rough types.

The first case responded well to the two drugs combined. The second was a fulminating case and died soon after admission to hospital.

We have to thank Dr. Edith Straker of the LCC, who typed the organisms, and our colleague Dr. K. J. Randall, who performed the necropsy on the second case.

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Medical Societies

NUTRITION SOCIETY

THE society met on May 26 at the London School of Hygiene, with Prof. J. R. LEARMONTH in the chair, to discuss

Nutritional Factors Affecting Wound Healing

Dr. D. P. CUTHBERTSON, of the scientific staff of the Medical Research Council, spoke of *Dietary Protein in Relation to Convalescence from Injury*. The protein depletion which followed moderate to severe injury was essentially due to one or more of four main causes: (1) loss of actual tissue, (2) loss of blood or exudate from the injured area, (3) loss due to the excessive protein katabolism which normally followed injury, and to infection if that was superimposed, and (4) loss caused by disuse and reflex atrophy. The protein losses in a case of a 60% burn involving the whole thickness of the skin amounted roughly to: (1) 700 g. in the mass of skin and other underlying tissues destroyed, together with the leucocytic response involved in the separation of the sloughs; (2) 600 g. in the exudate from the weeping surface and also during the sloughing and granulation period; (3) 700–800 g. due to the katabolic reaction to trauma and the accompanying "traumatic fever"; an amount which it was not possible to evaluate consequent on the coccal infections of the first week and the mixed coccal and bacillary infections of the second to fourth weeks when the necrotic tissues were separating; and (4) 100 g. from atrophy due to disuse and to reflex action. A further depletion arose out of skin-grafting operations through further loss of blood and plasma.

In injuries such as fractures, dislocations and even
essive
exces-
phos-
[illegible] protein was being broken up. The negative nitrogen balance in the first 10 days after a fracture of the leg might amount to some 800 g. of protein or 8% of the total body protein. The increased katabolic processes were more general than local and appeared to arise out of a raiding of the body protein reserves for an endogenous supply of amino-acids for the reparative process, and of a mobilisation of oxidisable material for the enhanced metabolism of energy of the healing process. In the malnourished subject injury produced little or no rise in nitrogen excretion, and, conversely, an increase in the protein

balance at the
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the diet. The latter observation indicated that in trauma katabolism the supply of a key amino-acid was the object of the breakdown of protein.

The severity of the anæmia which developed after serious injury depended on the extent of hæmorrhage. A loss of about 20% of the total blood-volume would reduce the hæmoglobin level from 100% to about 85% within 48 hours after wounding—that is, when the compensatory increase in plasma volume was complete. Losses of 40% and 60% of the blood-volume would reduce hæmoglobin to about 70% and 50% respectively. The
r and the red-cell volume
eral days after injury in the
infection. The meaning of
[illegible] nor was it known to what level hæmoglobin could fall without interfering with recovery
In burns of all
the initial period
[illegible] the red-cell levels continued to fall for 10–11 days. When recovery was slow anæmia persisted, probably because of defective marrow function. It was important to determine how far the inhibition was due to a toxin and how far to a competition for available protein between the hæmopoietic system and the area of healing. A protracted period of protein deficiency led eventually to well-marked atrophy of the liver, spleen, bone-marrow, and lymphoid tissues, from which most of the phagocytic cells originated; moreover, the deficiency affected the anti-
h the production of
a negative nitrogen
no real indication to
the 5th to 9th day,
[illegible] should be encouraged to eat as much as he conveniently could of a diet rich in protein and containing enough carbohydrate and fat to cover energy requirements and allow the maximum anabolism of tissue protein. A daily protein intake of 150–200 g. was indicated after burns, where the loss of body protein could amount
milk reinforced with dried sk
preparations, and cream could
protein and calories, while meat and its extractives had an appetising value. It was always necessary to ensure that such diets were adequate in minerals and vitamins. An increase in the intake of protein was most conveniently achieved by simultaneously reducing the amount of fat, while an increase in the total intake of food could be attained by feeds between meals, such as flavoured milk shakes

absorb protein was seriously impaired. Properly prepared enzymic or acid hydrolysates of casein which did not induce pyrogenic reactions could now be obtained. They were usually administered in 5% concentration either dissolved in 5% glucose solution or given

olution.
during
[illegible] should be taken to see that the needle extended well within the vein beyond the insertion of a tributary and that it did not occlude the lumen; 1½ litres of a 5% solution of hydrolysate was required daily to meet the normal basic requirement of 1 g. of protein per kg. body-weight; in addition the energy requirement should be supplied by intravenous or oral feeding. The rate of infusion of the hydrolysate should not exceed 3–5 ml. per minute, and that of glucose 10 ml. per minute. Patients on the verge of hunger œdema or of œdema from traumatic anuria or oliguria during the period of [illegible]

to supplement hydrolysates with vitamins. Casein digests could also be given by mouth or by gavage, but they were unpalatable, and for this [illegible]

given more quickly and in higher concentration than hydrolysates, but they were too costly for general use at present.

Mr. P. B. **Croft**, of the Department of Biochemistry, Oxford, reviewed the work done there (*Lancet*, 1945, i. 260) on the sparing effect of additional protein and of methionine on the nitrogen loss following burns
ancil
ined
, the
[illegible] Indies, and Gambia, and studied their diet. The
cracked dry skin
in the other two
B_2 complex was
[illegible] *Lancet*, June 16, 1945, p. 760), and even worse in the West Indies, but was adequate in Gambia where they were derived from fermented cereals. The Newfoundland diet contained, however, twice as much protein as that of the two southern communities, and it seemed likely that the skin lesions were associated with an inadequate consumption of protein.

Captain J. A
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intakes [illegible] disadvantage of the now accepted standards of food for convalescents did not stand out.

VITAMIN-C DEFICIENCY AND HEALING

Mr. J. F. **Danielli**, D SC, of the School of Biochemistry, Miss **Honor Fell**, D SC, of the Strangeways Research Laboratory, and Dr. E. **Kodicek** of the Dunn Nutritional Laboratory, all of Cambridge, said that in the normal guineapig the uninjured skin was almost devoid of phosphatase and only the hair follicles, sebaceous glands, and occasional capillaries contained the enzyme. There were two peaks of phosphatase activity after trauma: one due to invasion of the wound by leucocytes, and a second associated with the differentiation of collagenous fibrous tissue. In acute deficiency of vitamin C the wound became fully epithelialised but was filled by a large dome-shaped mass of fibroblasts with a sparse irregular network of very abnormal intercellular material bearing little resemblance to the profuse, neatly orientated collagen fibres of the normal animals, and the tissue was very œdematous and hæmorrhagic. The first peak of phosphatase activity was still present but the second was absent or negligibly slight. Guineapigs kept at different levels of partial deficiency provided a graded series of healing reactions, and the amount of phosphatase activity in the scar was correlated with the degree of differentiation. The findings were consistent with the suggestion that phosphatase was connected, directly or indirectly, with the metabolic processes more intimately concerned in the laying down of collagen.

Mr. P. D. F. MURRAY, D SC, of St. Bartholomew's Hospital Medical College, and Dr. Kodicek had investigated statements that deprivation of vitamin C led to the reopening of healed fractures in man and guineapigs. Fractures were inflicted on the fibulæ of guineapigs by means of forceps without open operation. Fourteen days after fracture, when callus formation was well advanced, the animals were given diets partially deficient in vitamin C and almost completely deficient in vitamin D, or deficient in only one of these factors, or well supplied with both. In no case did the callus reopen, although the animals were kept on the diets for periods ranging up to 3 months. In the guineapigs partially deficient in vitamin C the callus formed was smaller than that produced by normal guineapigs and union of the fractured ends was probably delayed, but the deprivation of vitamin D did not affect the repair of the fractures and rickets was not induced. The usual porosis developed in the bones of the scorbutic guineapigs ; hyperostosis was the rule in those which were submitted to fracture and it appeared occasionally in the uninjured leg of animals in whose other leg the fibula had been fractured, and in the legs of animals which had not been injured. Partial deficiency of vitamin C was an essential factor in the development of hyperostosis, probably leading to a weakening of the attachment of the periosteum and favouring its separation from the bone under stress. The appearance of hyperostosis in uninjured legs might be explained in this way, for the animals had to be periodically anæsthetised for X-ray examination, a procedure which was resented and led to bouts of violent kicking. Hyperostosis did not develop in an experiment in which no X-ray films were taken.

In a contribution read in his absence Mr. GEOFFREY H. BOURNE, D SC, of the Oxford University Laboratory of Physiology, reviewed the published work on the effects of vitamin C on wound healing and described his own experiments in this field carried out on guineapigs. On a recent visit to Ceylon he had heard of four patients whose abdominal operation wounds had shown no signs of healing. They had exhibited no symptoms of scurvy yet three of them had promptly responded to treatment with orange juice while the fourth who had not been so treated had died.

Recently the Scottish group, meeting at Dundee, discussed

Loss of Nutrients in the Preparation of Food

Prof. S. J. WATSON, after speaking of the losses borne by the farmer, pointed out that many foodstuffs are still living when placed in store and have to continue to respire in order to live. The process of respiration involves giving off carbon dioxide, which results in a gradual loss of weight. In potatoes this loss amounts to about 1·3% per month, so that by the end of June some 15–20% has disappeared. The vitamin C of potato also falls during storage till it reaches almost half the original value, but it rises again to almost the full amount just before sprouting begins.

Miss MARY ANDROSS compared the loss of nutrients when eggs are prepared in various ways. Scrambling results in a loss of 13·5%, poaching 7·5%, an omelet 3%. With frying at 126° C it is only 1·5%, but at smoking temperature (235° C) it is nearly 9%. Beef and mutton show a loss of 12–45% during cooking, according to the cut. Losses in vegetables vary much with demand and season. Green vegetables often reach the customer wilted, so that much has to be rejected. Lack of freshness means considerable loss of vitamins A and C. So great are the losses of essential elements under present conditions that there is a crying need for some other method of supplying fresh vegetables. Miss Andross emphasised the importance of producing vegetables at [illegible] of increasing market-gardening near towns, and [illegible] roving marketing.

In nine school canteens the plate waste averaged 7% for protein and for fat, but only 1·4% for carbohydrate, but plate wastage in the home was less than 2% for all the primary food factors.

Dr. C. P. STEWART said that, in cooking, fruit and vegetables may lose u[illegible] corresponding proportion of [illegible]. The latter are leached out more by boiling than by steaming. Addition of baking soda, by raising the pH, increases this loss, but the increase is not great and is partly compensated by the shorter time required for cooking. Though the percentage losses during cooking appear large, they may be of little real significance if the figures are small in relation to the total intake, but they are important in the case of certain vitamins not available in other foods. Ascorbic acid and aneurine are both subject to destruction during heating, the greatest loss occurring during slow cooking and while the food is being kept hot before being served. During April, 150 g. of whole potato boiled and quickly served should yield about 10 mg. of ascorbic acid, but if mashed and kept warm for an hour before serving it may provide only about 3 mg. In cooking meats or fish the loss of fat from liquefaction and leakage may amount to 7–20%. The loss of soluble salts, though high, probably involves only a small part of the daily intake. In cereals riboflavine, being relatively stable, is adequately conserved, but aneurine is more readily destroyed, especially when the pH is high. The loss is greater when baking powders are used instead of yeast.

Reviews of Books

Your Food

A Study of the Problem of Food and Nutrition in India
M. R. MASANI, chairman, People's Provincial Food Council, Bombay. (Padma Publications. Pp. 84. 1 rupee)

A SERIES of studies in current affairs is being sponsored by the great industrial firm of Tata. This, the first volume, is a worthy beginning. Food was chosen as the subject, as being the most "universal and compelling" of all problems. It is certainly a compelling problem in India, and Mr. Masani does not blink the fact. It is novel and valuable to have a book written by an Indian stating hard unpalatable facts about Indian diets, Indian undernourishment, and Indian mistakes in cooking and producing food. The power which has ruled India for so long cannot escape some of the blame.

Mr. Masani draws conclusions which though somewhat unpleasant must be faced. The inefficiency of labour, the apparent slackness of the workers, the low vitality and the low expectation of life, and the enormous population of India are all considered as causes, and he then proposes remedies—in agriculture, marketing, processing, and even in social habits. The whole is written in a lively "snappy" style with a minimum of technical terms. It is helped by clever diagrammatic illustrations which further press home the points. We commend the book heartily and hope it will soon appear in vernacular editions.

British Achievement in the Art of Healing

JOHN LANGDON-DAVIES. (Pilot Press. Pp. 40. 2*s.* 6*d.*)

IN this large pamphlet over a hundred good photographs illustrate various aspects of British medicine in war, and the text is a heartening tale of achievement which will not end with the coming of peace. It is a shop-window display and those who serve behind the counter should know, and not fear to be proud of, its contents.

Relief Worker's Vocabulary: French-English-German

VERNON UNDERWOOD, DOUGLAS SCOTT, RICHARD ULLMANN. (Friends Relief Service. Pp. 50. 6*d.*)

THIS little brochure, sponsored by the Friends Relief Service, is the work of three scholars. A triglot vocabulary of the simplest and most useful type, meant for individuals with moderate intellectual endowment, it completely achieves its purpose. To those who are helping to reable war victims in French-speaking and German-speaking Europe, it will be thoroughly serviceable, for it leaves no aspect of daily life untouched. And it is conveniently small.

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THE LANCET

LONDON: SATURDAY, JUNE 23, 1945

Indulgent Certification

IN war-time the doctor's certificate has become prerequisite to almost any claim to privilege, whether it be to procure a scarce article, an augmented diet, or freedom from direction to an unsuitable occupation. Doctors in consequence have become all too familiar with the ways of patients seeking certificates, and also with the difficulties that arise whenever anyone tries to establish an equitable standard of certification and encourage its general adoption. Doctors differ, and will go on differing, even over so relatively objective a decision as to whether a patient's illness does or does not fall within a schedule of disorders for which extra milk may be ordered. And even greater differences of honest opinion exist, and must always exist, when less obvious decisions are required. Two letters in our correspondence columns this week again draw attention to this problem, and stress the ease with which the doctor, whose natural inclination is to think first (and perhaps only) of his patient, can fall into the habit of giving certificates with a lenience not always in the best interest of the community.

Some doctors would at this point say that their duty is only to their patient, and that no other consideration should influence the decision. But to say this is to misinterpret the rôle of the medical certificate. Rightly or wrongly, we are not expected to act, in this matter of certification, solely as counsel for the promotion of our patients' claims to privilege. Were this our sole function our certificates would soon become suspect. In fact we are trusted to act also as arbiters, deciding which claims should be supported and which disallowed. Only by weighing all the pertinent factors is it possible to reach a decision which neither penalises the patient nor gives him an unfair advantage over his neighbour. Because most members of the profession understand this, and accept their position as arbiters, medical certificates are almost always accepted by employers and by public authorities without question. But if this acceptance of certificates is to be maintained, we must keep our standard of certification high.

In the fullness of peace, practitioners may hope to lose most of the diverse calls now made upon them for certificates; but there is one decision they can never evade, one certificate they can never escape—the certificate of fitness for work Nobody else can provide this. With the coming of a National Health Service we shall have to supply these certificates in even greater number than at present; many more people will be insured and entitled to benefit, and the expected higher level of benefit will almost certainly lead to a higher proportion of claims. The Government Actuary, writing in the Beveridge report, expressed his views on this subject in the following words:

> "While it is true that, as a result of a comprehensive health and rehabilitation service which is to be provided in place of the more limited existing medical benefit, a substantial improvement in the health of the community should be secured in due course, it does not necessarily follow that the cost of benefit will be correspondingly abated. This is due to the fact that under the altered arrangements there may be a tendency on the part of doctors to require longer periods off work in order to secure complete recovery from the effects of an illness, and there will be less incentive than in the past to return to work owing to loss of income. The combined effect is likely to be an increase in the immediate claim rate, though it is hoped that later there will be some reduction in prolonged cases where a permanently incapacitating disease is avoided by more comprehensive and effective treatment at an early stage." [1]

He accordingly proposed to allow for 12½% more claims being paid per person insured than are at present paid under National Health Insurance. This increase may well suffice to cover all genuine additional claims. But should it not do so, our duty to our patients remains clear: we must ensure that all genuine claims are met, no matter what load this places upon the health budget. As Dr. CHARLES HILL has said, "The doctor's job is to decide whether a man is fit for work, no matter whether the cash value of his certificate is five or fifty shillings a week." [2] We shall stand on this principle—that no patient should be required by economic sanction (whether imposed by bureaucrat [illegible] by employer) to find him medicall[illegible] primary duty. But the community will also expect of us that, when we do find that a person can safely work again, we shall say so. From the point of view of the community, it will always be wrong for anyone to withhold his services, and continue to accept a subsidy, when he is fit to resume an available useful occupation. This is equally true whether the subsidy he accepts is 5s. or 50s. a week. If it is 50s. the man's incentive to remain in benefit will be the greater, and the doctor's decision may be harder to make. Nevertheless it must be made. So would it not be well for us, as we try to help shape the coming health service, to give thought to ways in which the future doctor's path may be made less thorny? For it seems certain that any Government that introduces legislation establishing a generous State-provided benefit in sickness and disability will take steps to ensure that this provision is not abused.

Dr. LENNOX JOHNSTON, in his letter, argues that the choice lies between a salaried service and an extended system of inspection and checking by whole-time regional medical officers, akin to those now employed under National Health Insurance. To him the former course seems the lesser evil, and the only real cure. He feels that so long as a doctor's income varies directly with the number of his satisfied clients, he will have to be indulgent in certification or see his practice dwindle. We hope, however, that Dr. JOHNSTON is making too much of this side of the problem. No doubt all practitioners who have held strictly to a straight course through the seas of war-time certification have thereby lost some unscrupulous patients, who have sought elsewhere the unwarranted privileges denied them by this honesty. But few, we trust, are unlucky enough to have so many patients of this type that they constitute a really important proportion of their practice. Is not the greater difficulty likely to be in assessing, and where possible removing, the continued incapacity of the patient who is (or claims to be) suffering from some long-continued disability?

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1. Cmd. 6404, p. 183.
2. *Brit. med. J.* 1943, i (suppl. p. 61.)

And would not this difficulty still exist even if all the doctors were salaried? We believe it would, and that, however doctors are paid, it will be necessary in the interest of the patient, of the doctor, and of the community, to devise machinery which will allow—at the request of any one of these parties—for the independent examination of cases of long-standing illness. Such examination should allow not only for the assessment of fitness for work, but also for a second opinion as to whether any alternative treatment is likely to be beneficial. A consultant service, easily accessible everywhere, which we look to the new system to provide, will afford better and earlier opportunities for obtaining such second opinions, and may do much to get over the difficulty. But it will be both unnecessary and wasteful of specialist time to submit all these doubtful cases to the judgment of a consultant, and appropriate means must be sought for disposing of the simpler cases. Where, in the future, group practice becomes a reality, in partnership inside or outside health centres, it should be possible for the group of coöperating doctors to meet from time to time as a board, which could advise on the prognosis, and (if required) on the treatment, of any cases referred to them. Such an arrangement might greatly reduce the number of patients that would have to be seen by a regional medical officer, and might even make this officer's employment unnecessary, except in so far as he could be useful in surveys or the collection of statistics.

These suggestions may or may not commend themselves; but they, or alternative ones, need early and full discussion. We cannot avoid the duty of certification. Let us see that we undertake it under the conditions least likely to cause friction, and at the same time least likely to leave anyone with a sense of injustice.

Secretion of Acid Phosphatase by the Prostate

The presence in the living body of enzymes which split phosphorus from its organic compounds has long been recognised; they are important factors in the growth of bone and in several other biological processes. The hydrogen-ion concentration most favourable to the action of these enzymes is about pH 7 or on the alkaline side of this point; with increasing acidity of the medium they gradually become inert. In addition to these "alkaline phosphatases" an "acid phosphatase" is now known to exist, most potent at a pH of about 5. In man the prostate appears to be the principal source of this acid phosphatase, which though abundant in the urine during health is scanty in the blood. More recent observations have shown that an excess of this enzyme in the blood-plasma or blood-serum indicates the presence of prostatic cancer, and it has been found that periodical estimations of the acid phosphatase in the blood afford reliable evidence of the progress of the disease and the success or failure of treatment; so they have become one more routine task for the up-to-date pathologist. The value of such estimations is brought out by Wray on another page.

Acid phosphatase was discovered in human urine by Demuth[1] in 1925, using sodium glycerophosphate as [illegible]te. His observations were confirmed by Dmochowski,[2] who found great variations in the quantity present in different specimens of urine of the same specific gravity, and in the urine of a single individual from time to time. It is now recognised that acid phosphatase is widely distributed in the body in health, and can be detected, for example, in erythrocytes, spleen, liver and blood-serum,[4,5,18] but the quantities found in these situations are negligible compared with those in the urine or the prostates of healthy men. The greater amounts found in the urine than in the blood-serum suggested that the enzyme might be produced in the genito-urinary system, and this was confirmed by Kutscher and Wolbergs[6] and others,[7,8] who detected it in high concentrations in human seminal fluid. Thus in 43 specimens of ejaculate examined by Gutman and Gutman,[7] the acid phosphatase ranged from 700 to 3700 units per 1 c.cm. Further inquiry has shown that the prostate contains much more of the enzyme than do the testicle, epididymis, seminal vesicle, or vas deferens.[6] Earlier Moore and Hanzel[16] had discovered in prostatic extracts an enzyme which split inorganic phosphorus from sodium nucleinate in a pH 7 phosphate buffer; the enzyme was present in the prostates of two men, aged forty-five and seventy-three years, but not in that of an infant of four months. By histological methods Gomorri[17] has demonstrated an acid phosphatase within the cytoplasm of normal prostatic epithelium and in the cells of a prostatic cancer. The prostate may not be the chief source of acid phosphatase in all animals, for Gutman[8] found none in the prostate of the cat, rabbit, guineapig, or rat, though the monkey had as much as man. In the rat the preputial glands, which are relatively large, are rich in the enzyme. In man at different ages the acid phosphatase activity of the prostate—stated in King-Armstrong units per gramme of fresh tissue—is, at birth 4·5, at four years 1·5, at thirteen years 73·0, and between forty and forty-five years from 522 to 2284 units.[9]

We are still in the dark as to the biological purpose of the prostatic acid phosphatase, though it will be noticed that the acidity (pH 5) which is most favourable for its action corresponds with that of the vagina at the time of ovulation. That the acid phosphatase is closely concerned with reproduction is supported by the fact that its output depends on gonadal activity; not only is it formed in considerable quantity only after adolescence[16,8] but even in the adult the amount produced is controlled by the gonadal hormones,[8,9,10] being increased under the influence of androgen and diminished by castration or by giving œstrogen. To the clinician its main significance is in the diagnosis and treatment of prostatic cancer, for in most cases the cancerous epithelium, whether in the prostate itself or in metastatic deposits, is still capable of forming acid phosphatase,[10,11,13] and if metastasis has occurred the enzyme will escape freely into the blood where it can be detected,[10,15] whereas so long as the prostate is normal the acid phosphatase, if it passes into the blood at all, does so only in very small amount. Today a high concentration of acid phosphatase in the blood-serum—more than 3·5 K-A units per 100 c.cm.—is generally accepted as an indicator of prostatic cancer with metastasis, and a concentration as high as 10 K-A units is regarded as diagnostic of that disease, though occasionally prostatic cancer may be present in spite of a normal concentration in the blood-serum,[10] especially if metastasis has not yet occurred.

The information gained in these observations has been turned to good use in the treatment of patients. It has long been known that the prostate depends for its activity on the androgenic potency of the testicles, and that castration causes an abrupt cessation of prostatic secretion with atrophy of the glandular epithelium. Seeing that the cells of a prostatic cancer are usually differentiated enough to secrete acid phosphatase, like those of a normal prostate, it seemed possible that they too might become atrophic if deprived of androgen by castration, or by the administration of œstrogen which checks the supply of gonadotrophin from the pituitary and so indirectly cuts down the output of testicular androgen. HUGGINS and his colleagues[10 13] studied 8 patients, all of whom had cancer of the prostate with skeletal metastases, and found that daily doses of 1 mg. of stilbœstrol or 1·66–3·32 mg. of œstradiol benzoate lowered the concentration of acid phosphatase in the blood-serum, whereas 25 mg. of testosterone given every day raised it. Afterwards all the 8 patients were castrated, and the serum acid phosphatase at once fell in 7 of them to comparatively low levels and remained there for as long as 180 days. In a later paper HUGGINS[15] described the early effects of castration in 45 cases of advanced prostatic cancer, in 32 of which osseous metastases had been revealed radiologically. Twelve to thirty months after castration, 11 of the patients were still free from symptoms; their serum acid phosphatase had continued normal or nearly so, their osseous metastases had completely or partly disappeared, and their prostates were smaller and softer than before the operation. Since then, though the permanent cure of prostatic cancer is not claimed, the general experience has been that great temporary relief of symptoms usually follows castration almost at once. Time alone can show whether the operation prolongs life or ever effects a lasting cure. No adverse psychological effects from castration have been reported, though the fear of such a result has led some surgeons to ban the operation. In a recent authoritative document we read of "the devastating psychological effect of removal of the testes"—an imaginary sequel which shows how mythology can prosper even in a medium of science. The question whether the best way of treating prostatic cancer is by castration or the persistent administration of œstrogen is not yet settled; without definite facts opinions are conflicting. If cutting off the supply of androgen is the only cause of benefit probably castration will come to be the method of choice; but there are reasons for suspecting that œstrogen may also possess some direct capacity for restraining the growth of the malignant cells. Moreover, œstrogen may be of additional benefit by preventing the hot flushes from which men are liable to suffer in the early days after gonadectomy, and its action on the pituitary [illegible] advantage by [illegible] adrenals. Th[illegible] administratio[illegible] to castration in the treatment of prostatic cancer. But whatever methods of treatment are used, the immediate results can usually be observed with accuracy by periodical estimations of the acid phosphatase in the blood-serum.

References at foot of next column

Annotations

AN AMERICAN ADVANCE

MEDICAL care for 135 million persons, substantial grants for hospitals, a national system of unemployment insurance, and solid contributions to maternal, child-welfare, preventive, and research services are features of a United States Bill just introduced to the Senate by Senator Wagner and to the House of Representatives by Representative Dingell. A key to the impulse for reform in these fields may, perhaps, be found in Senator Wagner's reference to "the shockingly high rate of rejections under Selective Service."

Medical benefit—referred to in the States as simply "health insurance"—is to be planned not as a State service but as a financial device for meeting the cost of private service; "small, regular pre-payments based on their earnings . . . will give them security against catastrophic costs for which they cannot budget individually." The most vehement assurances are given against anything in the nature of regimenting doctors or patients; "the basic policy has been to provide medical and related services through arrangements that are worked out so that they will be satisfactory to the public and to those who furnish the services . . . that is the democratic way of doing things." Under the Bill the Surgeon-General acts under the supervision and direction of the Federal Security Administrator and in consultation with the Social Security Board and also in consultation with the National Advisory Medical Policy Council. This council comprises the Surgeon-General as chairman and 16 members, selected from panels of names submitted by the professional and other agencies concerned with medical and other services and with the operation of hospitals. It has also to include public representatives. Payments to "general medical and family practitioners or to general dental practitioners" are to be by fees, or on a per-capita basis, or on a salary basis, or on a combination of these bases, as the Surgeon-General may approve according to the wish of the majority of practitioners in each local area. But he may also make payments by another method to the minority. The fund to provide these services and also hospital treatment is to be constituted by taking 3% of wages. But if the fund runs short the Surgeon-General may temporarily limit the benefits. [illegible] al treatment [illegible] but may be [illegible] General has money to spare. Dependants are included.

For the construction, improvement, or enlargement of hospitals, especially in rural communities, a system of grants and loans is instituted, 1000 million dollars being allotted for this purpose in the next decade. Applications can be made by States, counties, health or hospital districts or non-profit organisations. Applications go to an advisory council for review and recom-

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Continued from previous column

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5. Waldschmidt-Leitz, E., Nonnenbruch, W. *Naturwissenschaften* 1935, 23, 161.
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17. Gomori, G. *Ibid*, 1941, 32, 189.
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mendation and the Surgeon-General then makes a decision. A grant may be from 25% to 50% of the cost, including equipment. There may be a loan of a further 25%. The National Advisory Hospital Construction Council is to consist of the Surgeon-General as chairman and of 8 members appointed after consultation with the National Advisory Medical Policy Council and selected from leading medical or other authorities who are outstanding in matters pertaining to hospitals, public health and other health services, and from among other persons who are concerned with the need for hospitals in urban and rural areas. In the case of both councils the members are to be appointed "without regard to the civil service laws."

Unemployment insurance, previously dealt with by States under State legislation, becomes a federal responsibility in continuation of the organisation of man-power for war purposes. It is to be associated with a national system of employment service.

In presenting the Bill much emphasis is laid upon the extensive consultation which has already taken place with responsible representatives in many spheres of national life. It is designed to avoid any interference with the broad basis of free enterprise; indeed it is claimed that social security of the right kind will make the system of free enterprise operate more smoothly and effectively.

ELECTRON MICROSCOPY OF CELLS

THE application of electron microscopy to the study of cells has lagged behind its use for bacteria and viruses. This is due in part to the war, which began soon after the electron microscope became at all widely distributed in laboratories, and partly to difficulties inherent in the new tool. One of these is the need to place the object to be examined in a vacuum, a procedure ill adapted to cytology. A second difficulty arises from the thickness of most cells. It occurred to Porter, Claude, and Fullam[1] at the Rockefeller Institute that the tenuous state of cells in tissue-culture might make them more suitable for electron microscopy. They have now evolved a technique for growing the cells on a plastic film which can be transferred on to a fine wire mesh after growth has taken place in culture tubes. The preparations have to be fixed, preferably in osmic vapour, and dried before being photographed. It seems a simple step to proceed from the examination of normal fibroblasts to those containing the Rous sarcoma virus but evidently this is not the case. The amount of new detail revealed in fixed fibroblast-like cells with initial magnifications of 1600 to 4500 times is such that a new interpretation of the normal fixed cell is needed before any progress can be made in the identification of pathological inclusions such as viruses. Moreover, the cells which are to be photographed are selected for thinness by previous examination with the ordinary microscope. In the fixed and dry state these vary from 30 to 60 micro μ, and they may or may not be the ones that contain virus. The nucleus itself is usually too thick for detailed study. Hope of seeing a tumour virus in an electron micrograph must thus be deferred a little longer.

QUICK RELIEF FOR FLAT FEET

THE use of procaine hydrochloride infiltration, advocated by Leriche, is now an accepted method of treating sprains, though there is still doubt about how it works. The anæsthetic effect may not be the one in every case. Sometimes benefit may come from the mechanical breaking up of adhesions, the relaxation of local muscle spasm, or the simple dispersal of tissues, for injections of saline or sterile water can be equally effective, though the pain they cause, due to the absence of the anæsthetic, makes them unpopular.

The latest use for procaine hydrochloride injections is for the relief of pain in flat foot. Hipps and Neely,[1] of the United States Navy, maintain that pain in the sole of the foot after exercise or unaccustomed exertion is due to overstretching and spraining of supporting ligaments. If the foot is structurally abnormal it becomes painful more quickly than a normal one. In the absence of infective, degenerative, metabolic, or gross traumatic causes they have found injections of great value. An injection shortens the average period of treatment from 33 to 6 days, halves the number of cases requiring admission to hospital, and reduces recurrences from 70% to 2%. Their method is to inject 15 c.cm. of 2% procaine hydrochloride into any painful or tender places —usually close to the plantar surfaces of the internal and middle cuneiform bones and the adjacent joints. This is followed by five minutes' alcohol massage to the sole, and a gentle quarter-of-a-mile walk. The injections are repeated every third day if necessary and are followed by 2–3 weeks of light duty. Since the average period of treatment was 6 days there can have been few cases needing more than three injections. In the control series the same routine was carried out with the exception of the injections. Each of the two periods under review extended over 9 months.

The suggestion which Hipps and Neely put forward, that the sprained ligaments of the painful foot "hypertrophy" under the stimulus of ambulation, which the injections have rendered free from pain, is difficult to accept. Blundell Bankart, it will be recalled, advocated the stretching of painful ligaments in flat feet. He attempted to make the feet so flat that no further stretch could occur. It is possible that the two methods relieve pain by similar means—by allowing or assisting the strained ligaments to stretch until all the ligaments are under the same tension, and none under excessive tension. One of the curiosities of the procaine treatment of sprains and fractures is that once the pain is relieved by the injection it seldom returns, although the tenderness persists undiminished for about three weeks. Hipps and Neely note the first half of this fact, and probably it is because of the second half that they find injections under the painful metatarsal heads of pes cavus of little value. Their report adds yet another piece of evidence to show that the old principle of resting painful parts is not always the most rapid and certain way of cure. Hilton's classic "Therapeutic Value of Rest" and Hugh Owen Thomas's dictum of "Rest, rest and still more rest" still apply to diseased structures. But sprains, strains, and many fractures do best if they can be made sufficiently painless for the patient to work them off.

LEGAL ASSISTANCE

WHILE a national medical service is nearer realisation than a national legal service, the Rushcliffe Committee has published its recommendations for improving the legal aid available. Poor persons committees and organisations which provide a "poor man's lawyer" are not regarded as adequate. The "poor person" (who should, it is suggested, be called in future an "assisted person") ought to have help in all the criminal courts if the interests of justice make it desirable, and in all the usual civil courts. He ought to be able to get legal advice for half a crown. Subject to payments by way of contribution from the person assisted, the upper limit of income should be raised to £420. The bachelor with £3 a week or the married man with £4 a week should not be asked to pay. The cost should be borne by the State and the scheme should be operated through the Law Society, with whole-time legal advice offices in populous centres. The president of the Law Society wrote at once to the *Times* to pledge the support of the solicitors, but he naturally asked for the release of solicitors and clerks for legal aid. The statistics of the use made of the existing facilities show a steady demand. Matrimonial cases, it is said, amount to 95% of the total.

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[1] Porter, K. R., Claude, A., Fullam, E. F. *J. exp. Med.* 1945, 81, 233.

[1] Hipps, H. E., Neely, H. *Nav. med. Bull., Wash.* 1945, 44, 262.

This is no occasion for comparing the services rendered by the medical and legal professions to those who are not well blessed with this world's goods. It is easy to be cynical over the fact that medical treatment is to be free to all but that justice will still be purchasable, or over the spectacle of learned counsel who seek to enter Parliament asking for the postponement of their clients' cases on a scale which would excite comment if physicians and surgeons took the same view of patients' troubles. Be that as it may, a leader in the *Manchester Guardian*, discussing the Rushcliffe report, observes that, if it is undesirable that the State should administer a scheme to assist its potential adversaries, the propriety of giving the Law Society a blank cheque on public funds is also open to question. The policy is perhaps the more interesting inasmuch as the Government has found it impossible to hand over the administration of medical services, involving as it does the use of public money, to any body not responsible to the electors.

LUCITE CALVARIUM

A remarkable contribution to the study of head injuries, made by the Medical Corps of the United States Navy, was demonstrated in a coloured film shown by Lieutenant Robert Pudenz at the Royal Society of Medicine on June 15. It was found possible in monkeys to replace most of the vault of the skull with a perfectly transparent plastic of lucite ('Perspex'). With the scalp and dura removed over this area, the film showed monkeys behaving normally while the surface of both cerebral hemispheres was clearly visible. This provided a fine opportunity for studying the effects of head injury on the brain, particularly the movement of the brain relative to the skull. With the aid of ultra-high-speed cinematography and a constant method of delivering a blow, the film clearly showed that even in minor injuries which caused no concussion all visible parts of the brain were involved in movement relative to the skull, the consequences of which when severe must be highly damaging to brain tracts. The nature of the movement is difficult to describe and has not yet been analysed in detail. A rotational and swirling movement is the one most easily seen and each movement involves a diminishing oscillation before ceasing. The movement is clearly seen in all parts of the brain including those remote from the site of injury. Fixation of the skull greatly reduces the amount of movement. Experiments with a small high-velocity missile were also demonstrated, a "through and through" bitemporal shot being used. In this experiment the whole brain appeared to be forced outwards in all directions in bursting fashion. The amount of brain destruction must have been very great and yet the injury was not immediately fatal. Experiments with tangential wounds have not yet been carried out.

DOCTOR AS BOGY-MAN

NOTING the frequency with which minor operations and inoculations in young children were followed by fears, some lasting for years, Levy[1] scrutinised records of 124 child patients exhibiting these symptoms. The maximum incidence of fears as a sequel to operation occurred in the age-group 18 months to 3 years. Of 25 children who were obviously upset and developed fears immediately after their operation, half had and half had not had previous fears. This fact, considered with many of the case-histories, suggests that the anxieties manifested may have had deeper roots, the operation merely acting as a peg on which to hang new and reinforced forms of pre-existing fears. Levy cites a father who had all his family blood-tested after the discovery that a maid had a positive Wassermann reaction; this is at least suggestive of undue anxiety in their upbringing. He makes an interesting comparison with the soldier's "combat neurosis," which is also closely associated with overwhelming physical fear, and in which there is the same sense of impotence in the face of danger, of being helpless against the source of the attack; the soldier needs to have implicit faith in the protective power and knowledge of his leaders much as the child fears less when he can trust his parents. On this basis Levy emphasises the extent to which postoperative fears can be minimised by preparation, explanation, and protection from some of the likelier sources of alarm.

THE MISSING MAID

THE census of 1931 showed that less than 5% of all private families in this country employed resident domestics, and three-quarters of these had only one. In a report on the post-war organisation of private domestic employment[1] Miss Violet Markham and Miss Florence Hancock point out that between the wars the younger generation increasingly despised this occupation, preferring even monotonous and ill-paid industrial work because it gave them freedom after working hours. The need was more and more apparent for some recognised standards of wages and hours round which responsible householders could rally; but meanwhile "good employers looked on helplessly while a feverish auction developed among the wealthy for a pair of hands at any price." The war has not so much solved as dissolved the whole structure of domestic service, and has brought great hardship to countless households. Family life among the upper and middle classes in Britain has for generations rested largely on the assumption of domestic help of some kind being available, and the universal pressure felt at the moment in every type of home is not the least unhappy consequence of the war. Unless women can make an organised effort to help each other in domestic matters, women's work outside the home is bound to suffer, and "it is idle to preach the need for a higher birth-rate if home life is to spell undiluted drudgery for the wife and mother." What has to be done is to develop a large and valuable field of work on lines in harmony with modern ideas. As a step in this direction Miss Markham and Miss Hancock propose the foundation of a National Institute of Houseworkers which would (*a*) supply competent workers, either trained by the institute at its own centres or of whose efficiency it is otherwise satisfied, and (*b*) adopt minimum rates of wages and conditions to which employers of its workers must conform. To overcome the difficulty that many would-be employers will not be able to afford wages commensurate with those paid in industry, they suggest that domestic service should be brought into line with other industries by allowing the employer, for income-tax purposes, to deduct from his taxable income the sums spent on necessary domestic [illegible] of sickness, as well as [illegible] authorities should be [illegible] iformed) "home helps."

In our correspondence columns this week the suggestion is made that steps should immediately be taken to form a service supplying the domestic needs of hospitals. Sufficient help of this kind would relieve the present excessive strain on nurses, and allow more of them to carry out their proper duties properly.

TYPHUS IN GREAT BRITAIN

[illegible] nons debate on the nation's [illegible] that 21 cases of typhus had [illegible] is country: 11 were prisoners-of-war repatriated from Germany, while 7 were medical students who were among the 100 volunteers for duty at Belsen. All these patients were promptly isolated and no secondary cases had occurred.

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[1] Levy, D. M. *Amer. J. Dis. Child.* 1945, 69, 7.

[1] Cmd. 6650, HM Stationery Office. Pp. 26. 6*d*.

Public Health

LOCAL HEALTH SERVICES IN THE USA

AT a meeting of the fever group of the Society of Medical Officers of Health on May 18, with Dr. M. MITMAN in the chair, Lieut.-Colonel HUGH R. LEAVELL (UNRRA) read a paper on present trends in local health service in the United States.

There was, he said, a definite movement to incorporate cities and the surrounding suburban and rural areas into a single administrative health unit. Health centres were much increased and provided all types of preventive (and in some cases also therapeutic) services. A movement to combine all government-supported health services under a single administrative head was under way despite objections on the part of some medical officers of health. Health education of the public was being approached on a much broader basis and in a more intelligent way than ever before. The quality of public health service was also improved through extension of the merit system, more adequate remuneration, more widespread full-time service, and wider use of generalised public health nurse. Planning on a nation-wide basis for local health units had been undertaken by a committee of the American Public Health Association with Dr. Haven Emerson as chairman. They recommended that the local health units in the United States be set up in accordance with certain fundamental principles:

(*a*) The entire area and population of the United States should be served by full-time local health units. (In 1942, 31% of the population had no full-time service.)

(*b*) The local community should be responsible for providing basic public health services—namely, vital statistics, communicable disease control, environmental sanitation, public health laboratory services, maternal and child health services, and public health education.

(*c*) A minimum population of 50,000 is ordinarily required to provide necessary financial support of a local health unit.

(*d*) The district for which a local health unit is responsible should have a distance from the centre to the periphery of not over 25–40 miles.

(*e*) Districts to be set up should include both rural and urban population where possible, and there should be a minimum of 3 general-hospital beds per 1000 population, and a physician-patient ratio of not less than 1 to 1500.

(*f*) The minimum personnel required for a local health unit is: medical officer, 1 public health nurse per 5000 population (with at least one of supervisory grade); 2 sanitation officers per 50,000 population (with at least one of professional grade); and 1 clerk per 15,000 population.

(*g*) The local health unit should be suitably housed so that its work may be performed effectively.

These recommendations have been implemented by nearly all the 48 States in their planning. They will be used by the United States Public Health Service in its very important job of allocating federal funds for health purposes to the various States.

Dr. MELVILLE MACKENZIE (Ministry of Health) said that on a recent visit to the United States he was much impressed by the enthusiasm of public health workers. Coöperation between the public health and university authorities was close. He cited instances where the statistical approach to problems had proved very helpful in planning future public health programmes. Public health nurses were highly trained and not considered eligible to practise until 28 years of age. They tackled a wide range of health problems in home visiting. Laboratory facilities in the best public health departments were highly developed: in some cases it was obligatory for the practitioner to submit specimens—e.g., in a suspected typhoid case—and health officers were kept informed of possible foci of infection by receiving copies of laboratory reports. Diphtheria immunisation tended now to be combined with immunisation against whooping-cough and was undertaken when the child was three months old. In some areas it was considered necessary to inoculate all children against tetanus. In many health centres the social amenities for parents and children avoided the atmosphere of a centre to which people only came when they were ill. Health education, including that of th medical profession, was actively pursued and wide us was made of wireless and schools for health propagand

Dr. ANDREW TOPPING (UNRRA) felt that healt propaganda was sometimes considerably distorted [illegible] the press in America. He was surprised to find th payment was sometimes required for essential treatme such as plasma transfusion. He agreed that America public health nurses had a long and exhaustive trainin but felt that the best type of health visitor in th country was second to none. The ratio of 3 hospit beds per 1000 population was only half the numbe aimed at in this country.—Colonel LEAVELL late explained that the figures he had given were minimal.

Dr. F. J. BENTLEY (London County Council) wa comforted by the fact that the United States had foun it difficult to avoid some of the complexities of publ health administration which worried us in this countr —He was assured by Colonel LEAVELL that the shortag of nurses was equally acute in America where th public health service was subsidising the training 60,000 nurses. In reply to other questions Colon LEAVELL said that any State could refuse to adopt th recommendations for reorganising their health service although some financial pressure could be exerte Medical care (including hospital provision) was unfo tunately not always the responsibility of the publ health department. In matters of housing the depar ment was in an advisory position only. The large local health units would be in the big towns and migh include populations up to 250,000, but units of th size would be exceptional.

Special Articles

GOVERNMENT AND GOODENOUGH REPOR

CRITICISMS BY THE PRCS

ADDRESSING the Royal Faculty of Physicians a Surgeons of Glasgow on June 4, Sir ALFRED WEB JOHNSON, president of the Royal College of Surgeons England, declared that the royal colleges and corpor tions have reason for anxiety [illegible] acceptance of the report of [illegible] on Medical Schools. This [illegible] without consultation with the representative heads the medical profession, and on its recommendatio financial sanctions had already been imposed whi seriously encroach on the freedom of the profession a the medical schools.

"In the first place," said Sir Alfred, "instead of the Gene Medical Council being invited to consider whether the medic curriculum requires revision in view of the report of th committee, they have been informed that substantial gran will be made for medical education only on condition that t curriculum is revised. The General Medical Council shou be free to decide for itself, after free and independent co sideration of the merits of the case and the safety of t public, whether substantial revision of the medical curricul is desirable or not, without financial coercion.

"Secondly, financial sanctions have also been applied try to compel all the London schools to admit women and me students, quite without regard to the desirability of mai taining at the heart of the Empire a school reserved exclusive for women, or of maintaining, from among 12 medical schoo in London, at least some of which would be regarded essentially men's colleges.

"Moreover, it should have been borne in mind th accommodation for women in all the London schools can on be obtained by excluding a corresponding number of me The experience of this war should be sufficient warning to t authorities that the result of this plan may well be that in t next national crisis there may be a more serious shortage men doctors available for service than there has been duri the present critical period."—(*Glasgow Herald*, June 6.)

The recommendations, Sir Alfred went on, tende towards prohibiting the practice of medicine without university degree. The royal colleges and corporatio had a duty to maintain portals of entry to the professio which are entirely under the control of the professio itself. They were professional bodies and their examina tions had a practical tone for which they were generall esteemed. They provided men and women from th

Dominions and other countries with a means of obtaining a British qualification. "A student should be free to submit himself to examination by an independent professional tribunal instead of, or as well as, by his own teachers. In the view of the Royal College of Surgeons the Conjoint diploma should be a guarantee of professional efficiency; the MB should be both a titular academic distinction and an indication of general culture and scientific attainment, and should occupy a position intermediate between the qualifying and the higher diplomas of the colleges. "The practice of medicine is essentially vocational and not academic, and a large proportion of the most useful and successful practitioners in the country have never obtained, and do not desire to obtain, a university degree.'"

BIRTHDAY HONOURS

THE honours lists issued on June 14 and 15 contain the following names of members of the medical profession:

Knights Bachelor

James Douglas Cooke, MB MELB., FRCS
MP for South Hammersmith since 1931.

Sidney Valentine Sewell, MD MELB., FRCP, LATE FRACP
Physician to the Royal Melbourne Hospital, Victoria.

Reginald Watson Watson-Jones, M CH ORTH LPOOL, FRCS
Civilian consultant in orthopædic surgery to the RAF

CB (Military)

Major-General Leopold Thomas Poole, DSO, MC, MB EDIN., KHP
Director of Pathology, War Office.

CMG

Prof. Albert Victor Bernard, CBE, MD
Late chief Government MO, Malta.

George Ernest Hugh Le Fanu, MB ABERD.
Late consulting physician at Liverpool to the Colonial Office.

Lucius Nicholls, MD CAMB.
Director, Bacteriological Institute, Ceylon.

Benjamin Stanley Platt, MB, M SC, PH D LEEDS.
Director of the MRC human nutrition research unit at the National Hospital, Queen Square, London.

Alexander Montgomery Wilson Rae, MD EDIN.
Assistant medical adviser to the Secretary of State for the Colonies; lately DDMS, Nigeria.

CIE

Lieut.-Colonel Kombar Ramaswami Krishnaswami Iyengar, OBE, MD EDIN., IMS (RETD).
Late director of the Pasteur Institute of Southern India.

CBE (Military)

Surgeon Captain William Innes Gerrard, OBE, MD ABERD., FRCP, RN (RETD.)
Air Vice-Marshal Thomas James Kelly, MC, MD DUBL., RAF
Air Vice-Marshal D'Arcy Power, MC, MRCS, RAF
Colonel Arthur Eaton Richmond, OBE, MRCS, RAMC

CBE (Civil)

Miss Kate Fraser, MD GLASG.
Commissioner, General Board of Control, Scotland.

Bernard Hart, MD LOND., FRCP
[illegible] try to the Ministry of Health.
[illegible] SE, FRFPS
[illegible] Medical Service, Scotland.
[illegible], FRCSI
Consulting surgeon, Rhodesian Air Training Group.

OBE (Military)

Surgeon Captain Algeo Lloyd Anderson, MD TORONTO, RCNVR
Surgeon Commander James Martin Flattery, RAN
Surgeon Captain David Walker Johnstone, MD TORONTO, RCNVR
Lieut.-Colonel Frederick William Kemp, MC, ED, NZMC
Lieut.-Colonel William Parsons Laffin, MB NUI, IAMC
Surgeon Commander Clarence Lucan Gray Pratt, MD LPOOL, RNVR
Colonel John Rowe, MC, MB, late RAMC
Lieut.-Colonel Norman Lyon Shepperd, MB LOND., FRCS, RAMC
Lieut.-Colonel Malcolm Stoddart-Scott, MC, MD LEEDS, RAMC TA.
Colonel Frederick Harold van Nostrand, ED, MD TORONTO, RCAMC
Colonel Gordon Abbott Winfield, MD DALHOUSIE, RCAMC

OBE (Civil)

Lieut. Colonel Amar Nath Chopra, MB PUNJAB, IMS
Inspector-general of prisons and director of health, Orissa.

Lawrence Wylie Fitzmaurice, MD MCGILL, FACS
Colonial Medical Service MO and bacteriologist, Bahamas.

Nutting Stuart Fraser, MD EDIN.
Consultant, St. John's General Hospital, Newfoundland.

Alastair Robertson Grant, MD ABERD.
Medical superintendent, Emergency Hospital, Whittingham, Lancs.

Henry Hastings, MB EDIN.
For medical and missionary services in Nigeria.

William Malcolm McAlister, MB EDIN., FRCPE
Medical superintendent, Bangour Emergency Hospital, West Lothian.

Peter John Macleod, MB GLASG, JP
Medical superintendent, Gleneagles Hospital and Fitness Centre.

Miss Alice Deirdre Kingsnorth Peters, BM OXFD
Senior MO, Royal Ordnance Factory, Chorley.

Lieut.-Colonel Moses Sendak, MD LOND., IMS
Superintendent, Special Prison, Ahmednagar Fort, Bombay.

Charles Milliken Smith, MD GLASG.
MOH for Northamptonshire.

Mrs. Clara Stewart, MB LOND.
Hon. secretary and organiser, Emergency Committee for Nurses, Leeds.

Herbert Watt Torrance, MC, MD GLASG.
Medical superintendent, Scots Mission Hospital, Tiberias Palestine.

MBE (Military)

Major Charles Bernard Ball, LMSSA, RAMC
Major James Menzies Clow, MB GLASG., FRCSE, RAMC
Major William Robert Dunlop, MD MANITOBA, RCAMC
Major Charles Vincent Scott, MD TORONTO, RCAMC

MBE (Civil)

Miss Dev Priya Bali, MRCS
Deputy Inspector-General of Civil Hospitals (Women), United Provinces.

Miss Alva Adeline Daniell, MB
Civil assistant surgeon, Civil Medical Department, Government of Burma.

Daniel George Shields, MB CAMB.
Area ARP MO, Norfolk.

John Edward Wright, FRCSE, FACS
Colonial Medical Service, surgeon specialist, Holbarton Hospital, Antigua, Leeward Islands.

Kaisar-i-Hind Medal

Miss Jessie Findlay, MD MANITOBA
Principal and professor of surgery, Women's Medical College, Vellore.

Bruce Lyman Carruthers, MD QUEEN'S UNIV., ONT., FACP
Director, Medical Centre, Miraj.

ELECTION CANDIDATES

THE first list of candidates for the General Election published in the *Times* of June 16 and 19 contains the names of the following medical men and women:

LONDON BOROUGHS

Bermondsey West—W. B. Pemberton, MD DUBL. (L. Nat.)
Chelsea—Dorothy Sharpe, MB LOND., FRCS (CW)
Fulham West.—*Edith Summerskill, MRCS (Lab.)
Hammersmith—*Sir James Cooke, MB MELB., FRCS (C)
Islington North—*L. Haden Guest, MRCS (Lab.)
St. Marylebone—Elizabeth Jacobs, MRCS (Lab.)
St. Pancras South-East—S. W. Jeger, MRCS (Lab.)
Woolwich East—Surgeon Lieut.-Commander R. F. B. Bennett, BA OXFD, LMSSA (C)

ENGLISH BOROUGHS

Leyton West—Bernard Guyster, MRCS (L)
Preston—Squadron-Leader Samuel Segal, MRCS (Lab.)
Richmond—D. Stark Murray, MB GLASG. (Lab.)
Rochdale—*H. B. Morgan, MD GLASG. (Lab.)
Southampton—*W. S. Russell Thomas, MB CAMB. (L. Nat.)
Hanley—Barnet Stross, MB LEEDS (Lab.)
Silvertown—Louis Comyns, LRCPE (Lab.)

ENGLISH COUNTIES

Penrith and Cockermouth—Lieut.-Colonel L. F. Browne, MD DURH., RAMC (Lab.)
Barking—Somerville Hastings, MS LOND. (Lab.)
Barnet—Stephen Taylor, MD LOND. (Lab.)
Orpington—G. C. Milner, MB CAMB. (Ind.)
Tonbridge—E. St. J. Lyburn, MB DUBL., (Ind.)

WELSH COUNTIES

Abertillery—Surgeon Commander J. J. Hayward, MRCS (Nat.)
Denbigh—*Sir Henry Morris-Jones, MC, LRCPE (L. Nat.)

SCOTTISH BURGHS & COUNTIES

Kelvingrove—*Walter Elliot, PC, MC, MB GLASG. (C)
Motherwell—*Robert MacIntyre, MB EDIN. (Scot. Nat.)
Orkney and Shetland—*Major Basil Neven-Spence, MD EDIN. (C)

UNIVERSITIES

Cambridge—Charles Hill, MD CAMB. (Ind.)
London—*Sir Ernest Graham-Little, MD LOND. (Ind.)
Scotland—*Sir John Orr, MD GLASG. FRS (Ind.)

C = Conservative. CW = Common Wealth. Ind. = Independent. Lab. = Labour. L = Liberal. L. Nat. = Liberal National. Nat. = National. Scot. Nat. = Scottish Nationalist. * = A candidate who was a member of the last Parliament.

In England Now

A Running Commentary by Peripatetic Correspondents

BEING isolated in Loch Whatnoch, attached to a Naval reception party for surrendering U-boats, is not the most exciting of jobs, though it has its moments. A crop of boils or a septic finger seem to be the worst ills that befall a Hun in an *Unterseeboot* approaching these shores. Nothing so interesting as a case of allergy to the White Ensign or to the Scottish climate has yet been observed. On the contrary, the men are surprisingly fit, sun-tanned, and indecently robust compared to some of our Jolly Jacks. The latter, however, will always make up in rude but magnificent wit what a few lack in brawn.

* * *

"I just can't understand it," said my friend John, the Consulting Physician, pointing to the *Times*. "Both A. B. and C. D. left £100,000. They were successful physicians in good practice, although by no means the ultra-fashionable of their day. How on earth could they have accumulated such fortunes?" "Perhaps they were left money, or made lucky speculations," I hazarded. "Perhaps you're right," he grunted. "But I knew them fairly well and they certainly had no obvious social contacts. A. B. was of very humble origin, and, judging by appearances and habits, C. D. was not born in the purple. And as for speculations, well I can't visualise either of them with the necessary financial acumen and enterprise. Let's assume they made this big money. Now what sort of a physician's practice would be necessary to enable one to save £100,000?" This was doubtless a rhetorical question, but I answered that I had not the foggiest idea. That, Heaven knows, was truthful enough. Such astronomical figures are as foreign to my experience as ski-ing is to a South Sea islander's.

"During the last three years," said John, "I have made nearly £11,000. I reckon that is a pretty good effort in war-time or any time for that matter, although I have been qualified thirty years. To do that I have worked 365 days in each year—366 in 1944. I don't suggest that I did a full day's work every day but there was not a single day when I did not do some sort of work, whether seeing patients, writing an article, preparing a lecture, or correcting exam papers. I'm dead certain A. B. and C. D. never worked like that. And at the end of three years I have saved £950."

"You forget the abnormal conditions," I objected, "the crippling income-tax, the outrageous price of everything."

"I do *not* forget these things. As an offset you have to remember that in these days there is no opportunity for luxurious living. Money can be thrown away but sane purchases are impossible. My expenditure has been that of bare existence, and although in some details ridiculously high it is strictly limited. I used to spend £120 a year on my clothes; during the last three years I have spent less than £50 in all. I have taken no holiday, not even week-ends. I have not been to one theatre, not even to a cinema. I have dined out twice. I have not run a car. From all of which I think it is fair to assume that to save 10% of your gross income is a reasonable allowance in normal times. How many patients a day could A. B. and C. D. have seen? I consider myself lucky if I can get through one case every three-quarters of an hour. Consider the usual routine of a consultation. It is no automatic affair of looking at the tongue, feeling the pulse, wagging one's head solemnly, and pronouncing a few pompous pontifical words of exhortation or advice. In most cases there is a long history to disentangle: one has to isolate the essentials of other opinions, to analyse pathological reports, examine X-ray films and electrocardiograms, and at the end be ready for more or less unlimited discussions and explanations with the doctor and the patient, not to mention a number of relatives who are often quite prepared to spend the rest of the day in what they consider to be a good cause. Three-quarters of an hour is a very modest estimate, working at high pressure. How many such consultations can one adequately handle? On exceptional days I have dealt with eight and the has left me with the conviction that even three ys a week would break me down. There may have been windfalls to A. B. and C. D. in the shape of lucrative long-distance calls. But don't forget they were not making money all the time. Apart from committees and other meetings there must have been plenty of unpaid work—hospitals, attendance on one's colleagues, their wives and sometimes their children, concessions to appeals ad misericordiam. You can accumulate a lot of silver cigarette boxes; but these don't take you far along the road that has £100,000 at the end of it."

"I suppose," said I lamely, "that they *must* have inherited money or done well on the Stock Exchange." "I suppose so," grunted John, and turned to the City page.

* * *

"When a man is bored with the *Out from the Battle* Exhibition he is bored with life," S. Johnson might have remarked. For you may know all about the layout of a RAP, CCP, ADS, and CCS, which you will find there life-size: it may be no treat for you to see that a triangular bandage can be compressed to the size of a matchbox; that the difference between a CCP and an ADS can be summed up in the fact that a CCP carries calomel tablets whereas an ADS carries ol. ric. in quarts and mag. sulph. by the pound; that self-heating tins can bring you a variety of pleasant milky drinks when you are wounded, where previously you got only tea, tea, or more tea; that the mobile cook-house (not mentioned in the programme) can cook for 50 men on its one high-pressure paraffin "range," supported by a battery of "hay-boxes"; or that the casualty must reach the CCS level before he can hope for a female hand to smooth his pillow. But have you seen the little wire clips which the Germans used to keep glass stoppers from popping out? Do you know the composition of their blood-substitute, 'Periston,' in which a plastic called polyvinylpyrrolidon provides osmotic properties and viscosity? Have you seen the 'Sparklet' insecticide sprays which when the top is broken off deliver a cloud of pyrethrins, DDT, sesame oil, and whatnot sufficient to kill every bug within 1000 c.ft.? Yes? Well, then, you ought to see the 'Plexiglass' models which convalescents cut with a fretsaw out of cockpit windscreens. And it will be worth your shilling entrance fee to watch the team of three volunteers renovating books for the hospital libraries at a speed of 50 a day. The exhibition is in the garden of Clarence House, on the north side of The Mall, near St. James's Palace: 11 AM to 7 PM on weekdays, 2–7 PM on Sundays, until July 31. As you may have gathered, its subject is the care of the wounded by the Army Medical Services and the Red Cross and St. John War Organisation.

* * *

The poet who wrote of "flaming June" was probably holidaying in the Highlands at the time. Up Deeside the countryside is ablaze with the bright yellow blossom of broom and whin, and the farmer who does not ordinarily appreciate these feasts of colour, for they mean lean farming land, is partially appeased by the thought that gorse in its fullest golden glory is augur of a good harvest. We had travelled from London to Aberdeen by third-class sleeper—a pleasant enough way of covering the 500 miles—in the hope of ridding ourselves once and for all of that jaded spiritless feeling called war-weariness that would persist despite long weekends and short uncomfortable war-time holidays. The soft grey granite (hard in another sense) of the northern city was at once soothing and restful, though the smug complacency of its inhabitants jarred on a mind still over-conscious of flying bombs and rockets. But in the country, to lie idly by the murmuring river and listen to the shrill cries of oyster-catcher (come inland to nest) and snipe, or the more distant wail of the whaup, to walk softly through the pine-woods seeing anew the wood-sorrel and wild orchid, to wander for hours over the "vacant wine-red moor," these things were the real mind-healers, and besides them the artificial worries of town life faded to nothing.

ROYAL SOCIETY OF MEDICINE.—At a meeting of the section of physical medicine on Wednesday, June 27, at 4.30 PM, Dr. A. Spencer Paterson will speak on electro-convulsive therapy, and Dr. E. J. Crisp on backache. On June 28, at 5 PM, at the section of urology Mr. Ogier Ward is to read a paper on surgical aspects of urinary bilharziasis.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

THE long Parliament of 1935–45 has come to its end. On June 15 the House of Commons assembled for the last time, attended prayers in greater strength than usual, and awaited the summons of the King's messenger, Black Rod. The door to the Lords was duly slammed in his face, as tradition prescribes, to assert the independence of the House. Then came a knocking at the door and the inspection, through a wicket, of the one demanding admittance, and the announcement to the House by a six-foot-four messenger of "Black Rod" in a stentorian voice. Black Rod, bowing at intervals, advances up to where the mace lies on the table and invites the attendance of "this honourable House" to the House of Peers, to which the Commons, usually two by two, one Government and one Opposition man in each pair, doth duly repair. In the House of Lords sit a representative assembly of their lordships, and on five large chairs sit facing the assembly the Royal Commission of five peers with the Lord Chancellor in their midst. All of them are arrayed in three-cornered black hats, scarlet and black silk sashes from the shoulder and collars of ermine around their throats.

The Lord Chancellor reads the very long list of Bills to which the royal assent is given in the Norman-French formula *Le Roi le veult;* and then he reads the statement proroguing the House until July 8. But this i[illegible] tradition. [illegible] prorogue it, [illegible] So the decre[illegible] separation of the Members who return to the House of Commons and then file by, one after the other, to shake the hand of the Speaker in farewell. For 150 members of the House the farewell is final. For many more it will be farewell for a long period; for not all who were MPs on June 15 wi[illegible] [illegible] Service votes, are declared.

The last four days of this Parliament's life have been carried on under the normal procedure of Government and Opposition. This has meant the debating of major issues in a way different from that when real business was arranged behind the scenes of the Coalition.

On Monday there was an important debate on education and the passing in an agreed form of the Family Allowances Bill. To get this Bill through it was necessary for Government and Opposition to compromise on vital matters concerning the duplication of payments to children. Compromise was regretted, but the value of having the measure on the statute-book is that the necessary organisation to carry it into effect can now begin and this will save months of delay in making family allowances effective. Family allowances are part of our legislation now, and that in itself is a great step forward.

On Tuesday we had a debate on the health services in the course of which Sir John Orr made his maiden speech. It was polished but direct and uncompromising, the scientist demanding action to bring into operation the existing knowledge of health and disease, and especially nutrition.

Members were anxious to know what arrangements have been reached between the Minister of Health, the local authorities and the voluntary hospitals, and the negotiating committee of the medical profession. Attempts were made to discuss the reports sent out to the profession by the British Medical Association; but the House found itself handicapped in discussion of a document which was unknown to a large proportion of Members. An appeal was made [illegible] the setting up of a National Health Service. If many doctors returning from war services buy themselves into practices, and if the arrangements in the future are an extension of the panel system, it is certainly going to make any great progress difficult. It was suggested that the EMS system might be used as the basis of a temporary structure to fill the gap, and the Minister paid a high tribute to the EMS which might have been paid at an earlier period.

The whole week has been packed with business—a grave statement on necessary reductions in rations "due to a decline in world food production," an odd spasmodic debate on whether candidates for Parliament should be allowed to wear Service uniforms, as proposed by the Prime Minister and vehemently rejected as contrary to King's Regs. by the Service Members especially and by the whole House; and a very grave debate on monopolies and cartels and how to prevent restraint of trade.

On Thursday it was announced that certain scientists were not to be spared to go to Soviet Russia—a fact only discovered apparently on the day they were due to leave—and there were other statements about grants for building of privately owned houses, subsidies for local authorities for housing, war pensions rates, and resettlement (training) allowances. The approach of a General Election has certainly a stimulating effect on Ministerial departments.

Mr. Amery, Secretary of State for India, announced the offer of the British Government of an all-Indian Viceroy's Council, with the exception of the Commander-in-Chief. This proposal, the result of consultations with the Viceroy, Field-Marshal Lord Wavell, during his recent visit to this country, opens the way to freedom for India if it be accepted. This freedom [illegible] he British Commonwealth [illegible] This great act of State— [illegible] England and India—gives India the opportunity of framing her own proposals for the future.

So this high level of debate on Imperial politics, and the carrying out of the highest traditions of the free British Parliament, ended the great long Parliament in which the war against the enemy on the continent of Europe was won.

FROM THE PRESS GALLERY

The Health of the Nation

THE House of Commons on June 12 devoted one of [illegible] re the Dissolution to the [illegible] e health of the nation. [illegible] a comprehensive national health service, said the Minister of Health, would be out of [illegible] could properly say w[illegible] in the white-paper [illegible] ively, and that in so far as they related to matters requiring legislation they were now largely completed. In these discussions there had been no question of any departure from the fundamental objects of the comprehensive service proposed in the white-paper. There had been no question of diminishing the fulne[illegible]s of its range, or of [illegible] niversal availability [illegible] alt not with objects [illegible] with administrative [illegible] nfirmed him in his [illegible] e effect to the great [illegible] the white-paper in a manner which would command the general agreement of all upon whom the work would depend.

THE BRIGHT SIDE

The nation's health during the war years, Mr. Willink continued, revealed an encouraging and cheerful picture, though the health services had had to operate under heavy handicaps. About a fifth of the medical officers of the public health services had gone into the Forces; and almost a third of our general practitioners. Hospitals had often been hard pressed by shortages of nursing and domestic staff. But there had been no serious epidemic. In six winters we had had only one (mild) influenza outbreak. The incidence of cerebrospinal meningitis, which rose sharply in the early part of the war, had gradually fallen again, and typhoid fever had been less prevalent than in any peace-time year. Generally, infectious diseases had been less prevalent than in normal times, but there had been an increase in infective jaundice. The birth-rate had been rising since 1941, and last year was the highest since 1925. The effective reproduction-rate for 1944 was provisionally assessed at 0·990, or within 1% of a full replacement standard. The infant-mortality rate—one of the most reliable guides to the nation's health—was last year 46 per thousand births, compared with the previous peace-time low record of 50·6 in 1939.

The priorities for mothers and children had often been given at the expense of the adult civilian population. Yet though there had been an increase in tiredness and minor ill health civilians of all ages were living at least as long as they did in peace-time, even taking into account deaths in air-raids.

The vitamin supplements, the National Milk Scheme, and meals in school must all, Mr. Willink felt, have helped to improve the health of the children. The Government's food policy, and a high level of employment and purchasing power, had done the same for the country as a whole. We had proved that soundly based health services would stand up to severe strain. We had developed public education in health; rehabilitation techniques had been extended. We had organised a blood-transfusion service which had saved thousands of lives in war, and could save many more every year in peace. Our experience with the Emergency Hospital Scheme showed that hospitals of all types could work together for the common good.

New low records of both cases and deaths had been established each year since the diphtheria immunisation campaign first got under way in 1941. The number of deaths last year was less than a third of the pre-war average, and the number of cases just over half.

SOME SHADOWS

Mortality figures for the first quarter of this year, he admitted, did not maintain the improvement recorded in previous years. There was a slight setback in the infant and general mortality-rates. Venereal diseases showed a slight decline last year for the first time since the war, but new cases were still more than double the pre-war figure. The number of deaths from tuberculosis last year was practically the same as the pre-war low record of 1938, but there was a substantial increase in notifications of new cases, compared with before the war. The problem was to provide accommodation speedily. We had the beds, but could not get sufficient nursing and domestic staff.

The general woman-power situation was tighter than ever. In spite of the substantial addition to the total number of nurses during the war it had become increasingly difficult to maintain essential services. More nurses were urgently required to meet both current needs and the additional demands which would arise from the comprehensive health service. The Ministry of Labour was making an appeal in a new campaign addressed to both trained nurses and women without previous nursing experience.

REHABILITATION

Rehabilitation had been greatly developed during the war in hospitals within the Emergency Medical Service. More than 11,000 patients in EMS hospitals were now taking daily courses of remedial exercises. In addition, 20,000 were attending hospital daily for special exercises and remedial games. Of these 31,000 receiving rehabilitation, 15,000 were taking part in some form of occupational therapy. Since 1943 the number of hospitals providing rehabilitation had increased from 150 to 300, and more than 250 doctors had been given special training. For hospitals handicapped by lack of accommodation 34 prefabricated buildings had been provided. The Ministry was prepared to continue to encourage and assist the development of rehabilitation as an integral part of the health services.

BLA CASUALTIES

For the first time in our history, last year provision had to be made to receive casualties in England direct from the battlefield. A few hours before the invasion nearly 1000 doctors, nurses and students were moved, in secrecy, from London to the coastal hospitals. Between D-day and VE-day, 160,000 casualties from North-West Europe passed through EMS hospitals, and 20,000 flying-bomb casualties were also treated. Coastal [illegible]e hospitals with 1200 beds received patients unfit [illegible]el. Transit hospitals with 7300 beds, corresponding to casualty-clearing stations, were reached from the ports by road or by a short railway journey. Patients were finally moved to home base hospitals consisting of the larger and more important hospitals in England, Wales and Scotland, where for some weeks before D-day admission of civilian patients had been restricted to those in need of immediate treatment.

Provision was also made from the start for the reception and distribution of air-borne casualties brought back from the Continent in empty transport planes to three aerodromes in the neighbourhood of Swindon. The general scheme for the reception and treatment of these casualties was similar to that for sea-borne casualties, with hospitals corresponding to port hospitals for those unfit to travel. The remainder of the casualties were, however, transported to home base hospitals direct by train, no intermediate use being made of transit hospitals as casualty-clearing stations. With the collapse of Germany, Service patients of another kind came under the care of the EMS—liberated British prisoners-of-war, together with civilians released from enemy hands.

All this work had been done by an organisation unique in our history. Never before had the voluntary and municipal hospitals been welded together into an organic whole, working together under the regional and central direction of medical officers of the Government while preserving the internal autonomy of each hospital and the clinical freedom of the medical staff. Never before had the leading medical and surgical specialists placed themselves at the disposal of an organised medical service, and by their dispersal up and down the hospitals of the country spread their special knowledge among the medical profession as a whole. And never before had it been possible on a national scale to separate out the patients requiring special treatment for special conditions—head injuries, facial injuries, burns, neuroses and so on—and to send them to centres set apart for them.

A MAIDEN SPEECH

Sir JOHN ORR, FRS, in his maiden speech as a member for the Scottish Universities, said that health should be regarded as the natural state of human beings and disease should be regarded as abnormal. The two great aggressors of health were inadequate food and housing, and adequate housing did not mean only the houses themselves, but hygienic houses in an environment free from endemic disease. In New Zealand where there were practically no slums and no malnutrition, and where there was social security, the expectation of life at birth was nearly 70 years. In the smaller democratic countries in Europe—Norway, Sweden, Denmark and Holland—in which there were few slums and the standard of the working class was fairly high, the expectation of life was 63–65 years. In England, where there were slums, malnutrition and other effects of poverty, it was only 61 years. In Scotland, where housing and poverty was worse than in England, the expectation of life was only 57 years, and as one went down the economic scale there was India where it was only 27. During the war the distribution of food in this country was adjusted to the needs of the population. Though the wealthy classes had got less than before and had suffered inconvenience, they had not suffered in health. The diet of the poorer classes had been levelled up, and their consumption of proteins, calcium, phosphorus, iron, and all the vitamins, with the possible exception of C, had increased 10–40%. There were already indications of an improvement in the health and physique of the working classes. If the level of housing and feeding were brought up to recognised health standards, and there was an assurance of social security in this country, more than half of the diseases which afflict the working classes could be prevented. We could also add ten years to the expectation of life of their children. As a farmer he knew that we could do this with food quite quickly.

He was appalled to read in the housing debate how Members talked complacently about waiting 10 or 12 years before we could complete a full housing scheme. They must have forgotten the enormous productive powers of modern science. If we attacked the housing problem as we had attacked the munitions problem we could provide for every family a decent house in half that time.

HOW WHITE IS OUR PAPER

In opening the debate Mr. **JAMES GRIFFITHS**, who spoke from the front Opposition bench, said the Government had asked Members to commit themselves to the principles outlined in the white-paper on the establishment of a National Health Service and they had done so. Now he believed that there had been a departure from that committal, for the negotiations between the Minister and the BMA had not been about details or how the structure would be applied, or how it should be modified, but on fundamental principles. Mr. Willink had not negotiated with the BMA He had given in to them.

Mr. **WILLINK** interposed to say that he was a little troubled by the repeated use of the word "negotiations." The type of matter that Mr. Griffiths had just been discussing was something to which the word "negotiation" was perfectly appropriate, because agents were there acting on behalf of two bodies which desired to reach an agreement. But he himself had always used the word "discussions" and had not sought binding agreements. It was for Parliament to decide what the form of the service would be

Mr. **GRIFFITHS** said they would not quarrel about words; the important thing was that having obtained the approval of the House for certain proposals, the Government had put before the BMA fundamentally different proposals That was a betrayal of the House. It was not discussion or negotiation; it was capitulation. The future health service of the country was to be settled not as between the Government and the House of Commons, but as between the Minister and the BMA. Did the present Government stand by the white paper
nt? If not, what were
? Further, was it true
mentally different proposals to the BMA there was an assurance that if the Members accepted them the Minister of Health would press them on the Government?

Dr. **EDITH SUMMERSKILL** pointed out that it was no good exhorting the modern girl to emulate Florence Nightingale, who had had an independent income In spite of the Rushcliffe Committee's recommendations nurses' conditions required further improvement She asked the Minister whether it was correct that he had agreed to drop the introduction of health centres throughout the country In the white-paper it was also suggested that the voluntary and municipal hospitals should be administered by one board, that, too, had gone. It had also been suggested that in view of the dearth of doctors, doctors should be directed for the first few years after qualification to the industrial areas where they were needed. That proposal had also been dropped. Why was the Minister willing to persuade nurses to go where they are needed and not young doctors? A
proposal t res
should be ut,
but now th be
dropped. This would have provided a chance for young doctors who had been in the Services and who had not the capital with which to buy practices

Mr **S STOREY** denied the allegation that the Minister had dropped proposals approved by the House The House had agreed that the proposals in the white-paper should be the basis for discussion. Discussions had taken place with the bodies most concerned, and the House should wait until the Government had decided on proposals before any definite opinion was formed upon them.

Dr. **H B. MORGAN**, who is a member of the council of the BMA, said he was astonished at the anti medical feeling shown because the recognised organisation of the doctors had entered into negotiation with the Government and with other bodies to discuss something which would affect the whole conditions of their future work Like every other worker the doctor expected to be paid and he wanted good conditions of work Dr Morgan objected to certain terms of the white-paper which involved the direction of young doctors Mr. Willink had given him a personal assurance that it was not the intention of the Government to direct doctors into particular areas
these discussions?
availability, the ne

the doctor, adequate planning and prevention. Where
the Minister had allowed
wrong direction was in
structure. Unfortunatel
to put proposals before hi
profession a majority perhaps in most of the bodies. Although Dr. Morgan was keen that his profession should get a fair deal, he also
service for the poor. He thou
were allowed to continue things
He could not see how the new proposals about health centres should invalidate the establishment of such centres anywhere. He did not think that the manœuvring for position between one section of medical opinion represented by the BMA and other sections represented by different associations should be allowed to spoil the whole good picture. The scheme seemed to him to be based on the right lines.

Mr. **WILLINK** said that strong words had been used in the debate and it had been suggested that something had been done in conflict with the express will of the House. He wanted to make it clear that he was quite sure that the House contemplated that the debate on the white-paper would be followed by the widest discussions with all concerned and that there might be modifications within the general objects of a comprehensive health service. It was not for the Government to square their declaration of policy with some document issued by the BMA. If the House wanted a declaration of Government policy in the matter of health they would find it in the Prime Minister's declaration, and if there was any syllable of conflict between the BMA's report and the Prime Minister's declaration it was the declaration which stood. Some changes in
themselves to the Gover
tion, but he did not bel
change. All related to methods and not to principles, objectives or scope.

Dr. **HADEN GUEST** said that the Minister's statement had to a certain extent clarified the situation, but there
bance
Far
ession
he wanted to make sure that those discussions were sufficiently extensive Was the Minister satisfied that
the
sulte
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time
region to appoint temporarily on a salaried basis the doctors to carry out domiciliary treatment in any area which was not doctored This would bridge the gap between the present condition and the future proposals for a national health service.

Dr. **RUSSELL THOMAS** said that the large mass of the people of the country considered that the proposals
vices tended
d destroy the
country. The
interim document published by the BMA was no more than a basis for further negotiations. Dr. Thomas was not satisfied with that document, he did not think it was strong enough, but he could not see that the Minister was bound by it. The BMA could not bind the utterances and acts of the Government.

QUESTION TIME

Medical Officers in the BLA

Mr **SEABORNE DAVIES** asked the Secretary of State for War what proportion the number of doctors bore to the total number of men in the BLA.—Sir **JAMES GRIGG** replied: The ratio of medical officers of the RAMC to Army personnel, male and female, in SHAEF and 21 Army Group is about 1 to 182. The responsibilities of the RAMC include, however, considerable assistance to the other Services and to Allied forces and to displaced persons The degree of assistance given by the RAMC in connexion with these extraneous commitments, and the volume of the latter, fluctuate so greatly that any exact ratio of doctors to patients or potential patients of all categories is impossible to assess The best that I can give is that there are something of the order of 1400 people of various categories who have to rely on each member of the RAMC for health services.

Mr. SEABORNE DAVIES: Is the Minister aware that there is a widespread feeling in the RAMC that the proportion is too high and that many of them might well be released to come home to help their hard-pressed colleagues at home?—Sir J. GRIGG: That is as may be, but I would not be quite certain that in some cases that feeling is not connected with the desire to get home. What I am clear about is that certainly in theatres of war where active operations are still going on the supply of doctors is not too high but too low.—Mr. W. GALLACHER: Is the right hon. gentleman aware that in some billeting areas the proportion is 1 doctor to 4000 of the population?—Sir J. GRIGG: The average over the country is certainly less than that.—Dr. EDITH SUMMERSKILL: Is the Minister aware that under the National Health Insurance Act one civilian doctor is allowed for 2500 patients?—Sir J. GRIGG: I thought the number was 3000, but I am prepared to take the figure from the hon. lady.

Reduction in Rations

Mr. W. ASTOR asked the Minister of Food whether he would make a statement regarding the reason for the recent cuts in rations; and the possibilities of increases in rations at a future date.—Colonel J. J. LLEWELLIN replied: The reductions in rations announced in May were due to a decline in world food production and an increase in demand. The fall in production is attributable to the continuing shortage of man-power in producing countries, to lack of fertilisers, and to abnormal conditions of drought in the Southern Dominions, South Africa, South America, and the Caribbean area. There has also been a decline in the pig population of North America. The increase in demand is due, in part, to the increased requirements of the liberated countries of Europe. With the return of men to food production throughout the world, output will increase, and with the demobilisation of men from the Services, military requirements will decline.

Psychoneurosis and Tuberculosis Casualties

Sir JAMES GRIGG said that in 1943 and 1944 7621 other ranks were discharged from the Army suffering from tuberculosis and 42,480 suffering from psychiatric disorders.

Tuberculosis in ex-PoW

Replying to a question Sir JAMES GRIGG stated: Three-quarters of the prisoners who have returned have been examined by mass miniature radiography and the rest will be examined when they return from leave. So far 294 have been found to be suffering from tuberculosis. This is about 3 in every 1000. 158 have been admitted to civil sanatoria and 136 are in military and EMS hospitals awaiting admission.

Infant Mortality

Major S. F. MARKHAM asked the Minister of Health what were the infantile-mortality rates for the largest cities of the United Kingdom for 1944; and how do these compare with the principal cities of the USA, Australia, and New Zealand for the same period.—Mr. WILLINK replied: The following infant-mortality rates (per 1000 live births) were recorded in the largest towns of England and Wales in 1943:

London	51	Manchester	61
Birmingham	55	Sheffield	56
Liverpool	81		

Corresponding rates provisionally reported for towns in Scotland, Northern Ireland, British Dominions, and America were as follows:

Edinburgh	54	Brisbane	38
Glasgow	82	Auckland	35
Belfast	111	Wellington	34
New York	30	Christchurch	34
Chicago	29	Montreal	61
New Orleans	39	Quebec	104
Baltimore	41	Ottawa	45
Boston	46	Cape Town	41
Melbourne	34		

Rates for 1944 are not yet available.

THE KING has given permission to Dr. A. R. McKelvie and Dr. N. L Corkill of the Sudan Medical Service to wear the decorations of the Order of the Nile (fourth class) conferred on them by the King of Egypt.

MEDICAL SOCIETY OF THE LCC SERVICE.—There will be a meeting on Thursday, July 5, at 3 PM, at St. Andrew's Hospital, Bow, E3, when members of the staffs of Mile End, St. George-in-the-East, and St. Andrew's Hospitals will demonstrate cases.

Letters to the Editor

INDIA

SIR,—May I supplement the facts about my country given by Lieut.-Colonel Morris in your last issue?

Some years ago when Indian ministers were appointed in various provinces they had a unique opportunity to advance the cause of science and dispel ignorance and superstition. But one of the first things they did was to organise a nation-wide campaign on behalf of Indian medicine—i.e., Ayurvedic medicine for Hindus and Arabic medicine for Moslems. Public funds were utilised for opening schools and dispensaries of Indian medicine; practitioners of Indian medicine were admitted to a medical register; and some were given government subsidies. According to the Bombay medical registers there were 8600 doctors and 13,017 registered practitioners of Indian medicine in that province in 1941.

Your readers may form some i[illegible]cine from the claims made in the advertisement columns of some of the leading nationalist newspapers. For example:

> "—————— MA. Late Principal —— Ayurveda College, formerly professor of Chemistry —— College, has got very efficacious medicines (of Ayurveda, from Sadhus and those of his own researches on Himalayan herbs aided by Spiritual power) for Cancer, TB, Insanity, Hysteria, Epilepsy, Blood pressure, Intestinal ulcer, Asthma, Tonsillitis, Piles, Gout, Rheumatism. Women's ills, Eye diseases, etc."

Magicians, quacks, and medical practitioners are allowed to advertise their qualifications and some of their wonderful medicines which "cure all incurable diseases." One of these claims to have established that "man can swim in air as he does in water" and that the components of his medicine were discovered "while the author practised swimming in the air." Another is the manufacturer of a jewel which "heals incurable diseases, saves from accident, premature death, fire and theft, ensures success in examination, success in complicated law suit without difficulty, and success in overcoming enemies." His fantastic statements are supported by extracts from testimonials given by maharajahs, members of the Viceroy's council, ex-premiers of provinces, Indian High Court judges, and Indian members of the Privy Council, whose full names and addresses are also published. These distinguished people do not seem to realise the harm they are doing to the masses.

In the face of such unhealthy competition and frontal attacks on science it is not surprising that "impostors are freely using the letters FRCS or MRCP after their names with impunity; some are also using the letters MRAS . . . which is neither a medical qualification nor a recognised diploma; and others are adopting various devices to disguise their qualifications and palming them off on the unsuspecting medical and lay public as diplomas granted by the University of London or the Examining Board in England."[1]

No-one would quarrel with Indian ministers if as a result of their propaganda on behalf of Indian medicine they could show that they had succeeded in reducing the mortality from preventable diseases. But actually, as Colonel Morris's figures show, the state of affairs is appalling. In 1936 103,451 deaths from smallpox were notified in British Provinces alone. In the city of Madras in 1943 the death-rate was given as 37 per 1000, and infant mortality as 247 per 1000 live births. In England and Wales the corresponding figures are 12·4 and 58. Though such conditions prove the need for more health officers, the report of the Central Advisory Board of Health for 1939 says: "Three-quarters of the municipalities of British India are still without qualified health officers." The indifference of the municipal councillors who are elected by the people is deplorable.

India has about 37 institutions for [illegible] medicine, but the demand of the politic[illegible]tion and communal representation in the higher services has resulted in some men with mediocre qualifications being appointed as teachers. Also as Colonel G. R. McRobert[2] points out, Indian college authorities still prefer to promote assistants to professorships by seniority instead of advertising senior posts. At the 31st Indian Science Congress in 1944 the president of the medical and veterinary section lamented that "the level reached by the best Indian medical college is the same as the level obtained by the lower ranking medical colleges in USA, and in the medical schools conditions are very unsatisfactory in the majority of instances." There is a chronic shortage of medical instruments such as microscopes and of medical books.

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[1] *Ind. med. Gaz.* 1941, 76, 191.
[2] *Ibid*, 1944; 79, 177.

The total number of doctors (about 42,000) is inadequate for a population of 388 millions. Even government hospitals appear to be understaffed. Not long ago at a meeting of the Central Advisory Board of Health Major-General R. H. Candy, IMS, said that "a doctor is required to dispose of anything from 300 to 600 outpatients a day." He asked the board "what possible attention a patient could get if he was looked at for a minute." Despite the need for more qualified doctors hundreds of young men are unable to obtain admission into the medical schools and colleges. Last year out of 700 applicants to the Madras Medical College only 160 were selected. Among the non-government agencies which cater for the relief of suffering mention must be made of missionary (Christian, Arya Samaj and Rama Krishna Mission) medical services. Some of these doctors render their services entirely gratuitously, and by example and precept they uplift and enlighten the illiterate poor.

The reasons for this state of affairs are not hard to find. The belief of my countrymen in the wisdom of their remote ancestors is so profound that no modern advances in science induce them to change their habits and customs. The average so-called "educated" Indian is a dual or plural personality. He is not prepared to give up magical thinking in favour of statistical reasoning or the evidence of his own senses. When he puts on clothes cut in Western style he talks and thinks in English; but when he goes home and discards his suit he resumes the ways of his ancestors and scatters reason and logic to the winds. It is not unusual for a professor of bacteriology to talk to his students on tuberculosis or typhoid and at the end of his lecture go home, change into his *dhoti*, sit cross-legged on the floor, and in the course of religious ceremonies swallow cow's excreta without the least qualm of conscience.

The second basic factor responsible for lack of progress in medicine and for the general backwardness of the country is selfishness and greed leading to mutual distrust. The disproportionate salaries in the various medical services and in different grades of the same service, the "communal representation" in the matter of appointments, and the utterly inadequate salaries for the doctors in the lowest grades—Rs. 65 (£1 17*s.* 6*d.*) per month—all conduce to nepotism. If India is to attain a place of respect among the nations it will be necessary to appoint to the teaching posts doctors of international fame whose ability, integrity, and sincerity are above reproach. The salaries of doctors, nurses, and midwives should be raised not only to enable them to maintain their self-respect but also to signalise the dawn of a new era. Unless these minimum steps are taken it is futile to expect them to aspire to the lofty ideal of "service above self."

London. M. N. PAI.

TOTAL MEDICINE

SIR,—Sir Alexander Hood, in his Harveian lecture published in your issue of June 9, tries to present whole-time medical service in rosy hues, but succeeds in throwing another flood of the red light usually taken as a warning of danger. I do not for one moment want to disparage the magnificent work of the medical services with our armies throughout the war. But it is well that the nation and the profession should have yet another warning of what may be in store for them.

There are, in the first place, obvious fallacies in comparing the Army Medical Service with a whole-time civilian service, in that the former deals almost entirely with the cream of the population in the prime of early adult life, excluding the elderly, the unfit, the chronic invalids. Until 1939 army life was voluntary—those who didn't like it could stay out (whether doctors or prospective patients) and even of those who embraced it only a very small proportion spent most of their lives in it. But since everything in the AMS garden is lovely, can Sir Alexander Hood explain why (his words) "the Army Medical Service is not popular with doctors in peace-time"? (Why add "in peace-time"?) Perhaps because "directors and consultants . . . issue clinical recommendations and directives." If the soldier "is better o[illegible] remedia[illegible] of the R[illegible] civilian practitioners if they can. Is it due solely to what he calls "a readiness to believe almost anything to the discredit of a medical service"?

He asserts that the Army provides a service complete in itself in every respect, with hospital services available without any delay. Actually, in war, large numbers of soldiers as well as most of their dependants are treated in civil hospitals by civilian doctors. In fact, the waiting for hospital treatment t[illegible] has to submit is due [illegible] Service patients; and t[illegible] life. On p. 726 of the s[illegible] 30% of all the active practitioners on the register are serving. Waiting-lists, by the way, admittedly an evil, are to some extent a testimonial: if one cinema has a long queue and another has empty places, which is showing the better films?

But the real warnings, for population and profession, are scattered all over the lecture. "Freedom and efficiency . . . are incompatible. . . ." "Complete freedom is anarchy" (Shades of Fascismo!) "Some freedom must be surrendered by the community and by doctors." "There must be an element of discipline" in those who receive the service (i.e., the population). "They must go to the hospital appropriate to their condition" (or, where they are d— well sent) "and they must accept the doctor allotted to them." "Free choice of doctor is unattainable in a medical service, and the idea that the patient is the best judge of a doctor is not one to which most doctors would agree." "The *placing* of doctors by medical administrators . . . will result in a more efficient service," &c.

Well, since this comes from one who knows what a whole-time medical service means, we can't complain that we weren't warned.

Bristol. E. WATSON-WILLIAMS.

INDULGENT CERTIFICATION

SIR,—It must, I think, be agreed that impartial medical certification is essential to the success of the Beveridge plan: also that impartial certification, whether by doctor or layman, can be assured only if the income of the certifier is assured no matter what his decisions—i.e., if he receives a fixed salary. Opposition to a salaried medical service is tantamount, therefore, to opposition to the Beveridge plan.

With competition among doctors virtually unrestricted, it is necessary, in my opinion, to certify indulgently in order to retain one's practice. I have lost many patients by correct certification. Indulgent certification tends, however, to bring one into conflict with the regional medical officer. Personally I should prefer a salaried service to a revival of regional medical officers.

Wallasey. LENNOX JOHNSTON.

SIR,—Civilian doctors are overworked, and they might well have grown irritable and unreasonable under the strain. Yet they have mostly become even more kind and sympathetic than they were in peacetime. A large proportion of those now left in this country have reached years when trials of their own make them unselfishly understanding of the tests to which others are subjected. They are fatherly in their attitude, so that younger persons especially come in for their benevolent consideration. I think indeed that many practitioners are too kind. Because of this, they are unconsciously helping a number of persons to find loopholes of escape from their duty towards the State. You will have noticed that recently so many boys returned late from holidays with medical certificates that their employers asked the authorities to ignore the doctors' reports.

Medical men are, of course, in an awkward position. They have to make it as easy as possible for their patients to get back to complete health. That being so, the natural thing is to hand out a certificate that will permit the patient to keep quiet and be free from the worries and strain of work. It is not up to the doctor to put himself in an employer's place, nor even to consider whether, owing to the exceptional circumstances, his patient might not make a special effort to carry on. He does not feel that he ought to debate the matter and say, "Now let me see, there's a war on. Some people might not have come to me about this matter, but would have gone on working until they felt worse." Hence men and women who are not quite fit can take advantage of the usual good nature of medical men who regard it as their duty to make their patients better as soon as possible.

It is the easiest thing in the world to get a certificate of unfitness from the average practitioner, so long as one actually has something wrong. This certificate has only to be sent to an employer, and neither he nor the national service officer can do anything about it. To the doctor it is a small matter that a man or woman with an indisposition takes a few days off in order to *get better. It may be much more important, however,* to the employee's firm, where the absence may cause a hold-up.

I speak most respectfully to a learned, philanthropic, and self-sacrificing profession when I suggest that the elderly members who are mostly left to look after the civilian population should harden their hearts and put the brake on so generous an issue of certificates for workers who seek them. I know that, in ordinary times, these certificates are justified. But these are not ordinary times. These are days when patriots work at their machines and benches until they can do so no longer. There are many genuine cases who secure certificates; but, on the other hand, there are more than a few who shirk their legitimate duties by waving the medical man's slip of paper in the faces of the authorities and their firms.

When I was in a great aircraft engineering factory I saw the two types around me. I saw machines left vacant periodically by employees who managed always to get certificates from doctors of whose leniency they boasted. I watched others working while under doctors' orders, taking vitamins and the like to keep them going. It is unfortunate that the former type can so often make a doctor into an active ally. In their hearts, the slackers have no real gratitude for the goodness of their doctors. And workers who keep on keeping on are roused to suspicion, quite unjustly, of the medical profession when they see their unworthy colleagues able to produce medical certificates practically whenever they like.

London, NW6. D. A. SCOTT.

SHORTAGE OF NURSES

SIR,—The correspondence in your columns concerning the training of nurses reflects the urgency of the situation. While thousands of patients are withheld from treatment for lack of nursing care, no positive steps are evident to attract into this work suitable personnel now leaving the Forces. The matter must receive attention quickly or the opportunity will be lost for ever.

Shortage of nurses, if it truly exists, is doubled by the fact that nurses today spend nearly half their working day in extraneous duties. End this, and not only will available nursing-power immediately be increased but nurses will be free to do the work they set out to do—to nurse. The emancipation of nursing-power from its domestic shackles will be the first step towards true professional status.

As a teacher of nurses, I applaud the scheme put forward by Miss Carter and Miss Pearce for the new training of professional nurses (*Lancet*, June 9, p. 737). Its essentially practical character should re-embody in the nursing spirit that kindly, gentle, and capable person we want. This plan comes back in a way no other has done to fundamental issues. The pre-hospital course of simple scientific and technical subjects, followed by two years' hospital training and practice of basic nursing procedures is sound reasoning. This is the second step towards true status.

The third step is recognition of the trained bedside nurse's right to salary and conditions comparable with those of other forms of nursing work and those of other professions. Only full acceptance of these ideals will bring to the profession the intelligent, educable woman so badly needed.

But who is to undertake the non-nursing duties? A new type of skilled worker is required.

Under the auspices of the Ministry of Labour a new National Auxiliary Service for Hospitals (NASH) could be created. This would supply trained hospital orderlies, male and female, many of whom could be recruited direct from similar service in the Forces. Others—both Service and civilian—who are willing but have no experience will need short courses of practical training. For this purpose the Ministry of Labour could requisition the various training centres which already exist under the "training for all" scheme. In hospital the trained orderly will need good working conditions. Hours of duty, remuneration, duties to be performed, holidays, and so on would be settled by negotiation with the trade-union that would no doubt be formed. The work should be pensionable, and—a matter of no little importance—a smart uniform should be supplied.

This [illegible] embarked upon without delay. [illegible] which lies upon nursing, services [illegible] is relieved, nurses can have little time or indeed strength to discuss matters relating to future policy.

J. EYRE.

KNEE INJURIES IN SOLDIERS

SIR,—Major Wilkinson and Captain Burt in their interesting paper of June 2 draw attention to the unsatisfactory results of knee-joint injuries in the present war. This disquieting fact has also been recorded by others. May I stress the point, with which the authors would no doubt concur, that the poor results seen under war conditions should not be regarded as characteristic of normal times. We should avoid unjustifiable pessimism about the treatment of knee-joint injuries, if only in fairness to those who have laboured to improve it.

History is repeating itself, for during the 1914–18 war precisely the same phenomena were apparent. May not an explanation be found in two principal causes?

1. *Inadequate treatment of the early stages of many injuries of the knee-joint before patients reach the convalescent depots and orthopædic centres.*—There is still insufficient appreciation in many quarters of the great importance of preventing wasting of the quadriceps and other muscles, and particularly of the vastus internus. Major Wilkinson and Captain Burt point out that many of the cases that arrived at the convalescent depot showed (*a*) inability to brace back the knee, (*b*) localised areas of periarticular tenderness, (*c*) effusion, and (*d*) joint instability. I have, times without number, observed (*a*), (*c*) and (*d*) in cases where the quadriceps has become weak and wasted owing to inadequacy of early treatment. With regard to (*b*), the areas of persistent tenderness may often be prevented by appropriate physical treatment in the early stages. A stitch in time saves nine!

I am unable to speak with recent experience of the EMS hospitals, but at the 1000-bed EMS hospital where I worked for a few months in 1940 the department of physiotherapy was a little larger than an average bathroom, and there was a mere handful of physiotherapists who were unable to cope with the large number of cases of injuries to joints, including many knee-joint injuries. Such cases often had to be placed upon a waiting-list! Eventually a good many of these patients found their way to orthopædic centres and convalescent depots, where adequate treatment was presumably available; but the damage had been done and the syndrome to which Major Wilkinson and Captain Burt refer had already often been established. In the subsequent years some of these grave deficiencies, but perhaps not all, have doubtless been rectified.

2. The second cause is mainly *psychological.* Men in the Services have done a magnificent job in this war, but the great majority long to return to their civil occupations and to their families from whom they have often been separated for long periods. Heaven forbid the implication that these splendid fellows do not try to get well, but these factors sometimes create a subconscious psychological atmosphere which is inimical to complete recovery. Genuine malingering I believe to be much less common than is sometimes supposed.

The results of removal of a semilunar cartilage in Service patients illustrate this point, for they are almost grotesquely at variance with

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ballers. I may perhaps be permitted to mention that the player described by them who played in a practice game four weeks, and in the 1st division team six weeks, after operation was one of my operation cases. Such results are by no means exceptional, and to the best of my knowledge and belief no professional footballer in my personal series operated upon for an *uncomplicated* lesion of a semilunar cartilage has had to cease playing owing to persistent unsoundness of the knee. But the results in other followers of strenuous athletic pursuits and occupations are, as is well known (or was before the present wave of pessimism), equally gratifying. As an example of another strenuous occupation, that of the merchant seaman may be cited. With the kindness and coöperation of my colleagues at the Seamen's Hospital, Greenwich, and other hospitals, it fell to my lot some years ago to remove the semilunar cartilage in a large number of seamen. A careful follow-up showed that an extremely high percentage were completely cured.

Now follows a point which seems to me of great signi-
ficar　ame time, in
my　ng surgeon to
a M　upon a large
semilunar cartilage
-up found that the answers
checked by re-examination, were in many cases quite unreliable and valueless for statistical purposes. I came to this conclusion with considerable reluctance, but no useful purpose is served in concealing the facts.

It is noteworthy that the professional footballer loves football, just as the merchant seaman usually enters the merchant service because he loves the sea. In both groups, an important factor is present which is often lacking in the Service patient—viz., a strong urge to resume their previous avocations at the earliest possible moment. In the case of the professional footballer, an additional and important cause of his early recovery is, as a rule, the excellent condition of his thigh muscles before operation, which renders unnecessary a long period of subsequent re-education.

London, W1.　A. G. TIMBRELL FISHER.

BLOOD IN THE EYE

SIR,—In your annotation of March 24 (p. 319) you draw timely attention to the caution which should be exercised in the treatment of hyphæma, and you point out that atropine may not only increase the tension of the eye but also diminish the surface area of the iris which is available for absorption. There is also a third reason why atropine is dangerous in recent partial hyphæma. By dilating the pupil it is liable to reopen iris blood-vessels and cause further hæmorrhage. Three cases have been noted in this theatre of war in which a small hyphæma, which would probably have disappeared in 18 hours, was converted into a total hyphæma after atropine had been used. In total hyphæma it is unlikely that atropine will be absorbed.

The correct treatment for a recent severe hyphæma *per se* is to tie up both eyes and not to use drops which disturb the shape of the pupil in the early stages.

CMF.　B. W. RYCROFT,
Adviser in Ophthalmology, AFHQ.

TUBERCULOSIS

SIR,—The letter to the *Times* from Lord Horder and Drs. Conybeare, Hope Gosse and Geoffrey Marshall, which you quote in your leading article of June 2, contains serious criticisms of the tuberculosis service which should not be accepted without further proof.

It is the fashion nowadays for physicians not connected with tuberculosis schemes to talk about "backward authorities." The accusation may be justifiable in a small number of cases, but on the whole the service provided by local authorities for the treatment of tuberculosis compares very favourably with that provided by voluntary organisations and institutions.

At present, as you, Sir, suggest, there are numerous difficulties with regard to nursing and domestic staff. There is also a serious shortage of experienced medical personnel. This shortage would be aggravated by the establishment of a Ministry of Pensions or War Office institution for the treatment of pulmonary tuberculosis, and it is by no means certain that the service provided would be better than, or even as good as, that provided by the local authorities.

Welwyn, Herts.　A. P. FORD.

NAVAL DEMOBILISATION.—Will "Accidie" please send us his name and address (not for publication). Also if possible the text of the announcement to which he refers.

Obituary

NATHANIEL BISHOP HARMAN

M B CAMB, LL D MANC., F R C S

AFTER a long illness, Mr. Bishop Harman died on June 13 at his home at Crockham Hill in Kent. He was a man of exceptional attainments who did much for ophthalmology and also gave his time and talents to the profession through the British Medical Association. His interest in his own specialty and in the good of the public found joint expression in his work to create the National Eye Service. A direct representative of the profession on the General Medical Council from 1929 until a few weeks ago, he showed himself logical and clear-sighted; and in all relations of life he was respected as upright and unselfish.

orn in 1869
l St. John's
on scholar.
nces tripos
in 1898,
97 he was
, and after
African war, when he wrote a thesis on veldt sore, he became university demonstrator and examiner in anatomy. At this time he was writing not only on such subjects as the outflow of visceral efferent nerves in man, but also on the comparative anatomy of the oculomotor apparatus, and his thoughts increasingly turned to ophthalmology, both academic and practical. In 1901 he was elected ophthalmic surgeon at the Belgrave Hospital for Children and 1909 he joined the staff of the West London Hospital where he became vice-dean and later　. of the post-
lmic subjects
e was known
. Meanwhile.
he had been appointed oculist to the London County Council blind schools, and had thus set his hand to a great task.

"Bishop Harman's chief contribution to ophthalmology," writes J. H. P., "is his pioneer work in the investigation of the vision of school-children, and in the prevention or amelioration of their visual defects. In conjunction with the late Dr. James Kerr, and largely inspired by his early efforts in the same field, he examined thousands of children's eyes in the LCC schools, and organised the routine examination with his conspicuous administrative skill. He was responsible for the segregation and special training of partially sight
children in schoo
'myope' schools.
in the treatment
for the measurem
The treatment of visual
nsurance Act was largely
with considerable success,
by his enthusiasm."

The profession owes much to Harman's efforts to educate people in the necessity for a medical eye examination. A. C. recalls that "in the late twenties, when the Government was being urged to put the sight-testing opticians on a special register and thus recognise them as a separate profession it was alleged, and with truth, that large sections of the public could not afford an examination by an ophthalmic specialist but were compelled to go either to a hospital or to a sight-testing optician. Harman was the founder and the acti inspiration for the whole of its existence of the National Eye Service which provides a medical eye examination for insured persons, and those of like status, at a price they can afford. This movement, the existence of which may probably influence the decisions of the Government when it comes to provide a complete medical service, and Harman's work in promoting and guiding it, has never received from his ophthalmic colleagues the recognition it ought to have had; but Harman never complained. He was not that kind.

"He was for many years a great figure in the BMA, and was its honorary treasurer from 1924 to 1935, an unprecedented length of service in that capacity. He took a very active part in all its work, and as a speaker was always acceptable for the forthrightness and clarity with which he expressed himself, and his obvious sincerity. When the BMA went into its new house in 1925 his artistic capabilities made him very useful in adapting it for its present purpose. He was a very versatile person but never superficial. He wrote much on his own specialty and on other things in which he was interested, and published some volumes of verse. He was a sincerely religious man and wrote in the *Hibbert Journal* and elsewhere on the philosophy of Unitarianism, and he frequently appeared in Unitarian pulpits. He had a most generous disposition from which the BMA benefited in many ways, including a 'Treasurer's golf cup,' and a 'Katherine Bishop Harman prize' for the encouragement of research into the disorders incident to maternity. In its turn the association bestowed on Harman every honour in its disposal, including the vice-presidency and its gold medal. He maintained his high courage to the last in face of a most painful and protracted illness from which he was glad to be delivered. He was very fortunate in his family life, and during his illness he told me that this and the devoted attentions of his wife (also a medical practitioner) were his great consolations."

Mrs. Bishop Harman is the daughter of Arthur Chamberlain of Moor Green Hall, Birmingham, and he leaves two daughters and two sons, one of whom is physician to outpatients at St. Thomas's Hospital.

HENRY RICHARD KENWOOD

CMG, MB EDIN., DPH, FCS, FRSE

Professor Kenwood will be merely a name to many now engaged in public health, but 25–30 years ago he was one of the outstanding men in this subject and widely known to a host of workers and admirers. Although he was a capable and tactful administrator it is on his success as a teacher that his fame essentially rests.

He was born at Bexhill 82 years ago and was educated at Tunbridge Wells, Edinburgh, and Paris, qualifying in 1887. Three years later he became demonstrator under W. H. Corfield at University College, London; in 1896 he was promoted to be assistant professor; and in 1904 he succeeded his chief as Chadwick professor of hygiene and public health, holding the chair till he retired in 1924 as emeritus professor. He was particularly prominent in his teaching of the chemical part of part I. of the DPH which at that time was a very important part of the course and included much work now relegated to the public analyst. An able teacher, he realised that the doctors who came to his courses had largely forgotten their chemistry and that very little prior knowledge of chemical reactions could be assumed. To those who had more familiarity with the science the reiteration of very elementary matter was wearisome. but it was obvious that Kenwood knew what he was about; all his students understood and profited by his teaching and his list of successes in the DPH was always very high. The same clarity of expression and insistence on the explanation of details was obvious in his book on *Hygiene and Public Health* and in the companion volume of *Public Health Laboratory Work*, both of which went through many editions, and the latter was for many years the favourite practical handbook of the DPH student. He was also an admirable examiner in his subject, in London, Wales, and elsewhere.

Being so well known, Kenwood was often consulted by old students in their difficulties and he was unwearied in giving helpful advice and assistance. His knowledge was soundly based on his own experience, for he was MOH for Finchley (1894 1904), deputy MOH for St. George's, Hanover Square (1895–1905), and for many years concurrently MOH for the borough of Stoke Newington and the county of Bedford.

At one time president of the Society of Medical Officers of Health, in that capacity and otherwise he did much publicly and behind the scenes to frame and implement public health administration, and this was aided by a pleasant conciliatory manner and unruffled temper. During the last war he was made a temporary lieut.-colonel, RAMC, afterwards [illegible] rank and serving on the Army H [illegible] Committee. His active public work left him little time for scientific investigation, and in such work he was not specially interested, but a few useful studies stand to his credit. His Milroy lectures of 1918 dealt with teaching and training in hygiene.

By the older generation Kenwood is remembered as a congenial colleague, a skilful teacher, and a wise and reliable guide to the intricate problems of public health. His books may have outlived their usefulness, but their teaching and the spirit behind them endures.

JAMES PALEY BIBBY

MB LEEDS, MRCP

James Paley Bibby was named after the great 18th-century North-country ecclesiastic, author of the *Evidences of Christianity*. A Yorkshireman by birth, upbringing, and education, he was originally intended for a business career, but while studying textile engineering at Keighley he lived with his cousin Dr. Spencer, and in this environment he decided to change his faculty. Graduating MB at Leeds in 1907, he spent the next four years in a succession of first-class resident posts—he was house-physician to A. G. Barrs, house-surgeon to Harry Littlewood, resident medical officer at the Ida and Robert Arthington Hospital, and in London house-physician to Horton-Smith Hartley at the Brompton Hospital. With this experience behind him he returned to Leeds as resident medical officer at the Infirmary, a post which, owing to the war, he held for eight years.

In 1919 he was appointed physician in charge of the VD department, and in this office he was both a member of the honorary staff of the Infirmary and an official of the municipality. "Had circumstances been otherwise," writes M. S., "Bibby would undoubtedly have become a general physician. But the loss to general medicine was gain to a specialty which badly required the services of sane, level-headed, high-principled men. In his work he never spared himself, and, with evening as well as day clinics, he was left with but little leisure."

In the university, Bibby held the post of clinical lecturer in venereal diseases from 1919 until his death. An excellent teacher, full of common sense, he was trenchant yet diffident, but concealed his diffidence behind a mask of wit. For the last ten years he had been clinical sub-dean of the faculty of medicine, and he was also acting secretary of the Infirmary at the time of his death. In the duties of these offices he was as painstaking as in his professional work: no one could have been more punctilious in attendance at meetings or more faithful in the minuting of deliberations. "His generosity to the needy was unbounded. A man of broad sympathy and transparent honesty, he was intolerant only of humbug."

CHARLES RANKIN

MRCS

Dr. Charles Rankin, who died on May 8, had been for many years minister to a Presbyterian church in Liverpool. But after much thought he came to the decision that he could more truly serve his fellow men as a doctor than as a minister, and soon after he qualified in 1925 he was firmly established as a psychiatrist in Liverpool and in London. In 1927 he published *Religion and the New Psychology* and four years later he was appointed visiting psychiatrist to Walton Hospital. "Rankin's keen adventurous spirit" writes B. W. "led him to the investigation of the newer methods of vaccine and endocrine therapy in the treatment of those with a diseased mind. His previous work as a minister, his understanding of human nature, his readiness to help a colleague, his entire and simple faith all deepened his psychological insight."

On Active Service

CASUALTIES

DIED

Squadron-Leader HAROLD BERNARD HUNT, MD BIRM., MRCP, RAFVR

Lieutenant EDITH MARY ROBSON, MB LOND., RAMC

WOUNDED

Captain D. H. BROWN, MRCS, RAMC

Captain A. F. CRICK, MB LOND., RAMC

Captain G. C. GRIFFITHS, MB LPOOL, RAMC

Captain E. G. HARDY, RAMC

Major DONALD MACRAE, MC, MB GLASG., RAMC

Captain J. WATSON, RAMC

AWARDS

DSO

Lieut.-Colonel N. J. P. HEWLINGS, MB CAMB., RAMC

MENTIONED IN DISPATCHES

Surgeon Captain G. E. DORMER ELLIS, RN

Surgeon Lieut.-Commanders: F. W. BASKERVILLE, RN, R. B. H. FAICHNEY, RNVR, F. C. EDINGTON, RNVR.

Surgeon Lieutenants: G. M. BAIRD, RNVR, J. D. B. BAIRD, RCNVR, D. R. KERR, RNVR

MEMOIR

Squadron-Leader H. B. HUNT, who died on June 10 at the age of 33 while serving as medical officer at a RAF group headquarters in South East Asia, graduated MB at the University of Birmingham in 1935, took his MD two years later and the MRCP in 1938. After holding a house-appointment at the Birmingham General Hospital he was awarded the Fenwick asthma research scholarship, and later became assistant medical officer at St. Mary Islington Hospital. His published work included papers on the use of ascorbic acid in bronchial asthma, on differential serum vanadate sedimentation reaction and the eosinophil count in asthmatics. In 1940 he joined the medical branch of the RAFVR. He was a member of the Birmingham Archæological Society.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED JUNE 9

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1409; whooping-cough, 1033; diphtheria, 423; paratyphoid, 4; typhoid, 6; measles (excluding rubella), 8163; pneumonia (primary or influenzal), 427; puerperal pyrexia, 128; cerebrospinal fever, 52; poliomyelitis, 6; polio-encephalitis, 5; encephalitis lethargica, [illegible] diphtheria, 28; measles, 67; whooping-cough, 8.

Deaths.—In 126 great towns there were no deaths from enteric fever, 1 (0) from scarlet fever, 4 (0) from measles, 3 (0) from whooping-cough, 8 (0) from diphtheria, 15 (5) from diarrhœa and enteritis under two years, and 15 (1) from influenza. The figures in parentheses are those for London itself.

Birmingham had 5 deaths from diarrhœa and enteritis, Manchester 4.

The number of stillbirths notified during the week was 209 (corresponding to a rate of 30 per thousand total births), including 21 in London.

TATA MEMORIAL TRUST.—The following awards will be made by the trust in October for research in blood diseases, with special reference to leukæmia:

Grants for research expenses: Dr. P. A. Gorer (London); Dr. A. H. T. Robb-Smith (Oxford).

Personal grant: Dr. Penelope Hammick (Oxford)

Part time personal grant and grant for research expenses: Dr. Warner Jacobson (Cambridge).

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Notes and News

MEDICAL AND SURGICAL AID TO CHINA

To help the Chinese Government to build up medical services, UNRRA has arranged to send medical experts and supplies. Medical books urgently needed by the Chinese universities have already been dispatched, and part of their journey has been made by air. Thirty medical and health experts are being sent to train personnel in centres to be established by the Chinese government, and equipped by UNRRA. Training centres will be opened in Chungking and Chengtu early this summer, and later in Kweiyang. When Nanking and Peiping are liberated from Japanese control, other centres will be formed in these cities. Short intensive courses averaging 6–18 months will be given, and refresher courses are being planned for medical practitioners, as well as public health courses for recently graduated doctors and nurses who have not had public health experience, technical courses for partially qualified doctors and nurses, and training courses for attendants, nurses, and midwives.

Even before the Japanese invasion, China's public health services were wholly insufficient, and there was shortage of doctors, nurses, drugs, and hospital equipment. Now, after 8 years of war, it is estimated that there is only one doctor for every 40,000 persons in China, and one hospital bed for every 10,000 persons. War action has wrecked sewage-disposal plants and has contaminated water-supplies. Up to 40% of hospitals have been destroyed or looted. Danger to national health will be even greater when the millions who have been driven from their homes begin to return. It is stated that China will need to train roughly 35,000 technicians in the next four years to administer her medical relief programme.

For this programme UNRRA is now recruiting medical experts in the United States, Great Britain, Australia, and Canada. Recruits include surgeons, physicians, dentists, nurses, sanitary engineers, maternity and infant-care specialists, tuberculosis specialists, and hospital and public health administrators. The first to be sent will be men with general medical experience; specialists will follow later when training programmes are set up. Shipping space has been allowed to carry to India the supplies needed to start the training programme, and these will be moved into China by air.

These are long-term plans. While they are maturing, medical and surgical teams of the Friends' Ambulance Unit are giving immediate service to the Chinese Army. One such team, consisting of two or three doctors and 9–12 nursing and technical staff, has been working on the Burma Road where casualties have been brought over the mountains from the more advanced first-aid posts. Dr. W. M. Darling, the leader of the team, tells of a steady decline in war surgery compensated for by the growing outpatient work—minor surgery, chest fluoroscopy, and laboratory studies. The war surgery would have shown an even greater decline if it had not been for the unexpected arrival of a group of casualties from a clearing station elsewhere in the valley. The patients in that station had somehow been overlooked for three months after treatment by forward units. They were malnourished, infected with hookworm, toxic and exhausted from chronic suppuration in compound fractures which had never been immobilised, and in misery from huge bedsores. In spite of treatment and extra diet under the care of the unit, a third of this group died.

Dr. Darling is able to report how the ingenuity of the team saved the life of a man with a spleen ruptured in a fight. The cause of the trouble was only recognised when he was on the table, and he soon became exsanguinated. "We saved about 1100 c.cm. of blood, representing about half the total loss of blood, by wringing abdominal packs into a bowl containing sterile sodium citrate to prevent clotting. We prevented further loss by compression of the spleen pedicle, began transfusion of the blood, and completed removal. We tied his wound quickly together with stitches going through skin, muscle, peritoneum and all, and finished transferring back his own blood. The return of the blood to the circulation caused extraordinarily rapid recovery from what seemed hopeless hæmorrhage, and he has never looked back. So in the first all-Chinese transfusion I have successfully completed the patient was his own donor."

PADDINGTON MEDICAL SOCIETY.—The annual general meeting is to be held on June 26, at Paddington Tuberculosis Dispensary, 11, Newton Road, W2, at 9 P.M., when Dr. Z. Green, the president, will speak on war experiences in general practice.

PENAL REFORM

THE Howard League for Penal Reform, "a non-party organisation working for the prevention of crime and delinquency, the fair trial of accused persons, and the wise treatment of those found guilty of offences," believes that a comprehensive measure of penal reform is urgently needed and proposes that it should provide, inter alia, facilities for full medical and psychological examination of offenders after finding of guilt and before sentence; the abolition of the present antiquated and insanitary fortress prison and the extension of the minimum-security or camp prison with up-to-date sanitation and equipment for productive employment, education and recreation for body and mind: and the establishment of institutions for women conducted on the cottage-home plan, with adequate staff and equipment for medical and educational services, with particular emphasis on home management and child care. The League suggests payment of wages to prisoners, with division of earnings between the State (for maintenance), the dependants, and the prisoner, and the inclusion of prisoners as employed persons under any scheme for social insurance. It holds that every prison medical officer should possess a diploma in psychological medicine, and recommends reorganisation of services to provide better training for staffs of prisons, hostels, and schools, together with better salary scales and superannuation, and opportunities for transfer without loss of pension rights between all these and other branches of State social service. Non-penal colonies should be provided for habitual criminals who appear incorrigible; committal to and release from these colonies would be determined by a specialist treatment board working within a legal maximum sentence. The League's policy also includes abolition of imprisonment for all persons under 21, abolition of corporal punishment, and abolition of the death penalty. Its address is Parliament Mansions, Abbey Orchard Street, London, SW1.

J. IND. ARMY MED. CPS

THE Indian Army Medical Corps, formed in April, 1944, to supply the medical needs of the Indian Army, now has its own journal. The first number, just received, is dated January, 1945, and the journal is to appear twice a year, in January and July. The annual subscription is Rs5 and the editor is Colonel D. R. Thapar, OBE, MD, Headquarters IAMC, Poona. The cover is in cherry and gold, the Corps colours, and the journal opens with a message from Lieut.-General Gordon Wilson, DMS in India. The scientific articles are of the "review" type, by recognised authorities—Brigadier E. A. Bennet on Army psychiatry in India, Colonel E. E. Prebble on the treatment of venereal diseases, Major S. K. Das on sulphonamides in ophthalmology, Lieut.-Colonel H. R. S. Harley on penicillin, and Brigadier H. L. Marriott on scrub typhus—but the journal will perhaps be even more valued by members of the Corps, scattered throughout the Far East, for its accounts of personal experiences, awards, and other news of the doings of their colleagues.

Royal College of Surgeons of England

At a meeting of the council held on June 14, with Sir Alfred Webb-Johnson, the president, in the chair, the sixteenth Macloghlin scholarship was awarded to P. G. J. Duncan of Epsom College. Sir Reginald Watson-Jones was appointed the representative on the court of the University of Liverpool. Mr. Ernest Finch was reappointed the representative on the court of governors of the University of Sheffield, and Sir Frank Colyer a Hunterian trustee.

Diplomas of fellowship were granted to the following:

E. J. J. Borges, P. H. Lenton, W. R. Welply, Doreen Nightingale, F.-X. Darné, I. J. Thomas, D. G. Lambley, A. H. Harvie, and William Houston.

Diplomas of membership were granted to Jack Upsdell and to David Verel and diplomas in anæsthetics, jointly with the Royal College of Physicians, to the following:

Eric Asquith, Wolf Aukin, N. W. Bartrop, R. A. Binning, Angela J. Brayn, Diana M. M. Carr, D. J. Carter, John Clutton-Brock, T. A. Copp, Audrey M. Dealler, W. M. Dinwoodie, Elizabeth H. Flett, A. C. Forrester, Mary Foster, Margot W. Goldschmidt, K. N. A. Herdman, H. C. Hill, J. K. Irving, B. D. L. Johnson, Bernard Kenton, Janós Lorber, W. S. MacGowan, G. D. McGrath, H. P. Price, W. K. Rae, Kathleen M. Rains, David Reckless, Mary M. Richmond, Renée Ritchie, A. I. G. Robertson, W. N. Rollason, Benjamin Sullivan, Arthur Tom, Harry Walton, and B. H. Wilshere.

The Director-General of Army Medical Services and the regular officers of the Royal Army Medical Corps have sent a donation to the restoration fund. This brings the total of the fund to nearly £40,000.

University of Oxford

On June 9 the degree of BM was conferred on D. F. van Zwanenberg in absence.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty held on June 4, with Mr. W. A. Sewell, the president, in the chair, Sir Alfred Webb-Johnson, PRCS, was admitted to the honorary fellowship.

National Association for the Prevention of Tuberculosis

On Wednesday, July 11, at 2.30 PM, at the London School of Hygiene, Keppel Street, WC1, the association is holding a discussion on the problems of after-care of the tuberculous. The speakers will be Dr. F. R. G. Heaf, principal assistant medical officer of the LCC, Mr. R. E. Gomme, of the Ministry of Labour, and Mr. Peter Fraser, managing director of Papworth and Enham Industries.

Miss Nancy Overend, LLB, barrister-at-law, has been appointed social welfare secretary of the association. The appointment is a new post, designed to further investigation into the problems of rehabilitation and resettlement of the tuberculous, especially with regard to individual cases which do not easily fit into standard schemes.

Births, Marriages, and Deaths

BIRTHS

BERGH.—On June 15, at Staines, the wife of Dr. Henry Bergh—a daughter.

ELLIOT.—On June 10, at Moreton-in-Marsh, the wife of Major T. E. Elliot, RAMC—a daughter.

GELL.—On June 12, the wife of Dr. P. G. H. Gell—a son.

INNES.—On May 7, at Belfast, the wife of Dr. J. R. S. Innes, Colonial Medical Service, Gold Coast—a daughter.

JEFFERY.—On June 10, in London, the wife of Surgeon Lieut.-Commander C. C. Jeffery, FRCS, RNVR—a daughter.

LA FRENAIS.—On June 7, the wife of Dr. Walter H. L. La Frenais, of Runcorn—a daughter.

PEPPER.—On June 14, in Glasgow, to Patricia, the wife of Surgeon Lieut.-Commander Richard Pepper, RNVR—a daughter.

ROBINSON.—On June 7, at Slough, the wife of Dr. Allan Robinson—a daughter.

STEPHENSON.—On June 12, in London, the wife of Surgeon Lieutenant S. F. Stephenson, RNVR—a daughter.

MARRIAGES

DODD—BOND.—On June 16, in London, Harold Dodd, FRCS, Harley Street, to Mary Bond.

DOUGLAS—WHITLEY.—On June 9, at Lindfield, Donald Macleod Douglas, MBE, MS, major RAMC, to Margaret Diana Whitley.

DUNCAN—JACOBY.—On June 7, at Branksome Park, Malcolm Duncan, captain RAMC, to Eunice Ethel Jacoby, QAIMNSR.

JONES—BONSOR.—On June 12, at Birmingham, Arthur Jones, MRCP, captain RAMC, to Caroline Bonsor, VAD.

MILLER—JACKSON.—On June 12, at Northwood, Robert Alexander Miller, MRCP, captain RAMC, to Ida Isolda Astwood Jackson, MB, lieutenant, RAMC.

MUNRO—JONES.—On June 11, in London, A. Campbell Munro, CB, major-general IMS retd., to Aldyth Denbigh Jones.

MURRAY KERR—PEREIRA.—On June 9, at Lavistock, Peter Murray Kerr, surgeon lieutenant RNVR, to Philippa Waverley Pereira, WRNS.

DEATHS

BOYLE.—In December, 1944, in Guernsey, Michael Boyle, OBE, MB RUI, lieut.-colonel RAMC retd., aged 79.

COLVILLE.—On June 15, Ernest George Colville, FRCS, formerly of Ashford, Kent, and Folkestone, aged 86.

DOUGLAS.—On June 9, Claude Douglas, FRCS, of Oxford, aged 92.

HARMAN.—On June 13, Nathaniel Bishop Harman, MB CAMB., LLD MANC., FRCS, aged 76.

LAST.—On June 9, George Valentine Chapman Last, MRCS, PLC of Sefton Park, Liverpool.

ROBSON.—On June 10, at Coimbatore Military Hospital, India, Edith Mary Robson, MB LOND., lieutenant RAMC, of Ringwood Avenue, London, N.2, aged 25.

Appointments

HOSPITAL FOR SICK CHILDREN, Great Ormond-street.—The following appointments have been made:

FRANKLIN, A. W., MB CAMB., FRCP, temporary assistant physician.

NEWNS, G. H., MB LOND., MRCP, temporary assistant physician.

*** In our previous announcement (June 9) of these appointments at Great Ormond Street it was not stated that they are temporary. The hospital board has not, in fact, filled any vacancies occurring during the war on the medical or surgical staff. In order to cope with the increasing volume of work it has made temporary appointments, tenable, at its discretion, for the period of emergency. But when the emergency is ended, all vacancies will be advertised in the ordinary way and open to competition. This was made clear in the announcement reaching us from the hospital, but not in our abbreviated version.—ED. L.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

THE SPIRIT OF RESEARCH*

A PLEA FOR INDEPENDENCE

MERVYN GORDON, CMG, OBE, MD, BSC OXFD, LLD, FRS
CONSULTING BACTERIOLOGIST TO ST. BARTHOLOMEW'S HOSPITAL, LONDON

THE practical application of current knowledge to the alleviation of suffering and the prolongation of life is surgeon. Disease is or[. . . is known ; a greater part unknown. Research deals with the latter; it attempts to discover: in humbler branches to confirm and extend the discoveries of others ; in the higher branches to obtain knowledge at first hand on matters about which little or nothing is known.

Research is its own reward. A genuine investigator should be equally immune to the praise or blame of his fellows. After all, he is the best judge. They can only see part of the picture. He knows the reverses, the weary months spent in working in the wrong direction, the failures, the mistakes, the scrap-heaps, the disappointments, and the snubs that Nature often administers to him with such vigour when he begins to feel unduly hopeful or elated. Nature, however, is never one-sided, and few pleasures are equal to that of a genuine discovery, however small and unimportant. Nor is this pleasure neutralised when such a discovery is found to have been made previously by somebody else. That gives confidence and actual encouragement to an investigator who is worth his salt. In course of time the investigator will come to realise that Nature is never wrong, that the fault—when fault there is—lies with himself, and thus he gradually comes to be immune to disappointment. Failures can interest him equally with successes; for, properly applied, a failure may sometimes be made to lead directly or indirectly to success.

It is characteristic of bacteriological research that a plan made beforehand, however carefully it is schemed, seldom works in practice. It is also characteristic of such research that, provided the investigator is constantly at work, some new point or other will crop up. Such points may not always be new to others, and they may not be of much importance, but they serve as a fillip to the investigator and compensate him for much sterile labour.

A time comes in many a research when the question has to be decided whether the method shall be master of the investigator, or vice-versa. The truth is that each method only takes us a certain way, and science is advanced, not by methods, but by those who invent, apply, and improve them, or introduce better ones.

An investigator should expend as much care on the staff work of his research as on the executive portion. Both parts of his organisation should continually be reacting on each other. One of the difficulties of research is to judge correctly as to the right direction in which to advance, when to experiment over a broad front, when to concentrate, when to mark time, when to press forward, when to turn, and when to withdraw. Each advance must carefully be prepared beforehand by getting together the necessary materials. A big research is really a series of experimental campaigns, all of which need careful correlation and forethought in accordance with the relative importance and urgency of their various objectives

It has become fashionable lately to extol the advantages of team-work, and undoubtedly coöperation is advantageous in order to cover a wide field. At the same time if one examines critically the completed work of research teams, one will often find that when progress has been made, the key discovery was due chiefly to the enterprise or power of perception of an individual of the team. Investigations can be directed, and investigators kept in touch, but the advancement of knowledge is almost always due primarily to individual imagination, initiative, courage, industry, skill, or grip. In reality international teams are already at work They are keenly watching d-wide tournament with .. action for the benefit of mankind.

King Arthur's round table is thus a better symbol of research today than the organisation of the soldier or bureaucrat, however excellent and necessary such disciplined organisation may be for the particular purpose for which it was designed. The progress is not uniformity, but translated into experimental ac is one of the most precious, stimulating, and necessary qualities of an efficient investigator. It would seem that Nature does not yield her secrets to groups, but to individuals who have the *nous* first to formulate the right question, and then to ask it in the correct experimental manner. Nature is very particular about the last ; she only answers when compelled to do so.

An investigator cannot be too certain of his facts—they are sure to be challenged by someone or other—and further, he cannot take too much pains with his report. He will realise that to tell the exact truth is one of the most difficult things in the world. However much trouble he may take, someone will misunderstand him. But if he describes exactly what he did, and the results obtained, and keeps his inferences well within what his data justify, he can never be wrong. For that reason it is wise to distinguish between inferences and conclusions, because the latter may have to be modified in the light of further evidence.

No research is ever quite complete. It is the glory of a good bit of work that it opens the way for still better, and thus rapidly leads to its own eclipse. The object of research is the advancement, not of the investigator, but of knowledge.

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LYMPHOGRANULOMA INGUINALE IN THE ROYAL AIR FORCE

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LYMPHOGRANULOMA inguinale* occurs only in limited areas, but it is a serious problem in parts of West Africa and the West Indies. Admirably detailed accounts by Law (1943) and Stammers (1943) described the disease here 80–90% of the venient classification used in this article.

At a Royal Air Force station hospital in the West Indies over 30 cases were seen during two years in European airmen; and the disease and its control appeared to differ in some aspects from the accounts already mentioned.

CLINICAL PATHOLOGY

The stages of the disease have been summarised by Stammers and Law as follows :

Stage 1.—A firm solitary gland, usually tender, but often s mobile, and there are no skin ulcer or pimple which constitutes sible, but in nearly three-quarters of our cases there was neither history nor sign of this

Stage 2.—The stage of periglandular inflammation. The adenitis is more diffuse, and there is evident periadenitis. Skin changes appear, and in the fully developed phase a brawny mass is present.

Stage 3.—There is suppuration with softening of the matted glands. Usually there are multiple small foci (referred to below); but occasionally there is a unilocular cavity, which clinically may resemble an infected sebaceous cyst, with a firm ring of fibrous tissue around a soft fluctuant central zone.

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[*] It must not be confused with granuloma venereum, known in America by the still more misleading label "granuloma inguinale," an entirely separate clinical entity.

Stage 4.—Suppuration has gone on to ulceration. There is an area of purple necrotic skin, breaking down into one or more sinuses, or occasionally forming a single shallow ulcer. Even the most vigorous chemotherapy often has no demonstrable effect at this stage.

No anorectal lesions were seen. There seems little reason to suppose that these occur in men after normal coitus, no matter how severe the infection.

DIAGNOSIS

While the clinical picture was a very definite one, and the strictly inguinal distribution of the affected glands seldom suggested adenitis of any other origin (except syphilis), the Frei test was at times misleading. Of our first 40 cases of definite "clinical" lymphogranuloma inguinale, 10 had persistently negative Frei reactions, and 5 more were "doubtful negatives," only 25 (62%) being positive. The test, if negative, was repeated regularly, so an opinion could be formed as to the approximate time lag between the appearance of the bubo and the first positive reaction. This varied from 7 days (in 6 cases) up to 70 days, and in one case was 107 days. Three other points of diagnostic interest were noted. In many cases the temperature, especially during stage 2, was remarkably flat, usually about 101° F, but varying as little as 0·2° F between morning and evening; this "plateau" often lasted for 5 or 6 days. Secondly, it was shown in specific instances that a positive Frei could develop during chemotherapy; and lastly, in no case did the disease appear except after intercourse with a coloured woman.

TREATMENT

After an initial trial with intravenous tartar emetic in 12 cases, which gave only moderate results, sulphathiazole (and later sulphadiazine) was adopted. The routine dose was 25–30 g. by mouth in 5 days, and in stubborn cases this course was repeated after a brief respite. In 21 out of 26 patients the response to the sulpha drug was recorded as "good" or "very good," and this implied speedy and permanent resolution of the lesion. Neither anthiomaline nor penicillin was available, and so no comparison was possible.

Advanced cases.—It was in the management of cases in stages 3 and 4 (those showing abscess and sinus formation) that our experience materially differed from the West African reports. It was soon evident that these late cases were apt to be extremely chronic; and where chemotherapy had failed, and a sinus had become established, months might pass with no material change in the condition.

A mistake in the diagnosis and treatment of one of our first cases gave a clue to the basic reason for this sluggish progress. In this particular patient I decided to remove by block dissection a large mass of brawny and non-fluctuant inguinal glands of doubtful ætiology (the Frei test was negative then, but later became positive). No frank pus was encountered, but there was a "honeycomb" type of necrosis in the individual glands. The wound broke down, and, though no obvious infection was present, healing was very slow, taking 60 days in all. It was apparent that the cause of this slow healing was not secondary infection, but a gross disturbance of the lymphatic drainage. The whole wound area was of an almost "woody" consistency. It was later realised that the lesions of stages 3 and 4 were slow in healing for this very reason, and that a sluggish lymph return and not secondary infection was the main trouble. However, the slowly necrosing glands seen at biopsy appeared to need surgical intervention, because external drainage was very restricted, even after a spontaneous sinus had formed.

Surgical methods.—Since the healing of an abscess or sinus was thus retarded by both diminished lymphatic return and inadequate external drainage, some surgical aid was considered logical. The usefulness of aspiration has rightly been stressed, and 12 of our cases were treated thus, one man having pus removed on six occasions—in fact, we regarded this as the first line of attack whenever fluctuation was found. However only 5 of the 12 recovered without forming a sinus or requiring more radical surgery, in spite of strict precautions. Local injections of drugs was not tried.

The reason for these failures was later clear at operation, when large numbers of individual glands were found, showing intense fibrous periadenitis and containing a loculus of pus or necrotic material. When such cases did not respond to conservative measures and the skin appeared certain to give way (or had already done so), operation was carried out as follows.

Under general anæsthesia the abscess was incised (or the sinus laid open) and the affected area explored digitally. The associated loculi could be entered and curetted, much as a breast abscess is treated; by using the finger only, the danger of infecting healthy tissues was nil, since the extent of the necrotic zone was readily felt. Occasionally scissors were used to open a narrow and densely fibrosed track of the "collar-stud" type.

Sulphanilamide powder was then packed into the wound and kept in contact with it by a length of 'Vaseline' gauze. This was covered with 'Elastoplast' and left for 7 days. At the next dressing a clean red granulating surface was found, and the powder and gauze were reapplied. The wound then healed slowly, taking an average of 57 days. But the toxic symptoms and inflammatory signs, including the pain, were relieved, and the demoralising effect of a persistent sinus was removed. Consequently, in spite of the long convalescence patients were glad of the operation, for they could appreciate the steady clinical improvement that followed it. This attitude of the people most concerned was regarded as important support for an unorthodox procedure, since patients with chronic conditions are apt to be shrewd observers and critics. Eight cases were treated in this way.

DISCUSSION

From this series, where so few of the patients reached the advanced stage, it is impossible to adduce statistical proof that surgery gives the quickest cure. It can only be stated that several cases (before operation) showed absolutely no change with long courses of sulphadiazine, and the whole clinical appearance was reminiscent of an obstinate tuberculous lesion. Ultimately, secondary infection was bound to occur, and this (as Law points out) increases the toxic effects.

An average period of 57 days in hospital after operation sounds slow. But if proper "controls" had been possible we had little doubt that they would have been ill still longer. In other words cases of lymphogranuloma inguinale as seen in the West Indies, which fail to respond to chemotherapy, will in any circumstances require several weeks in hospital. And the reason for this lies in the fact that lymphogranuloma *is* a lymphatic lesion, and nothing can materially alter the inevitably poor lymph drainage. It is not impossible that cases in the Caribbean are more obstinate and indolent than those described elsewhere.

To say that secondary infection from outside is the main surgical danger is untrue, for the pus at operation is usually sterile, and with proper dressings and adequate drainage the wound should remain clean. It is only a menace when a spontaneous sinus is allowed to form. Surgical drainage cannot influence the rate of internal absorption but it does promote healing in three ways: by the evacuation of debris; by reducing tension; and through the local bacteriostatic effect of the sulphanilamide powder.

SUMMARY

A series of 50 cases of lymphogranuloma inguinale among white airmen in the West Indies is described.

Even when the clinical diagnosis was clear, the Frei test was often slow in becoming positive, and was sometimes persistently negative; it can become positive during chemotherapy.

Of 26 cases treated with sulphonamides by mouth, 21 responded well.

The slow healing of advanced cases is attributed to the disturbance of lymphatic drainage rather than to secondary infection.

Surgery is justified in late cases which do not respond to sulphonamides. The technique is described.

Much of the work on which these notes are based was done by Flight Lieutenant E. N. Gauld, officer i/c VD Dept. in this RAF Hospital, to whom I am greatly indebted; however, the opinions expressed here should be treated as a personal view. My thanks are due to the Director General, RAF Medical Service, for permission to publish this report.

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PRODUCTION OF STERILE AND STABLE PENICILLINASE

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THE bacteriological control of penicillin therapy often
of penicillinase. This
characterised by recurrent
bacterial endocarditis, and
in neurosurgical cases where the persistence of organisms in cerebrospinal fluid containing a high concentration of penicillin is not uncommon. Penicillinase is, moreover, essential for testing the bacteriological sterility of penicillin itself.

The methods of production previously described suffer from some disadvantages (Harper 1943, Duthie 1944). The insoluble bacterial powder of Harper is unsuitable
. confusing turbidity in
in surviving paracolon
uthie suffer from none of
. demands cultivation of
the organisms for several days with periodic addition
of penicillin t
confirm some
thermostabilit
be due to the
penicillinase obtained from a paracolon bacillus whereas Duthie's products were from strains of *B. subtilis.*

TABLE I—THERMOLABILITY OF PENICILLINASE IN SOLUTION

Penicillinase solutions (final dilution 1 : 40)		Units of penicillin contained in 1 ml. volumes											
pH	Heat treatment	1000	500	250	125	62·5	31·2	15·6	7·8	3·9	1·95	0·97	0
5·9	Unheated	−	+	+	+	+	+	+	+	+	+	+	+
5·9	60° C for 30 min.	−	−	−	−	−	−	−	−	−	+	+	+
5·9	80° C for 30 min.	−	−	−	−	−	−	−	−	−	−	−	+
5·9	100° C for 15 min.	−	−	−	−	−	−	−	−	−	−	−	+
7·2	Unheated	−	+	+	+	+	+	+	+	+	+	+	+
7·2	60° C for 30 min.	−	−	−	−	−	+	+	+	+	+	+	+
7·2	80° C for 30 min.	−	−	−	−	−	−	−	−	−	−	−	+
7·2	100° C for 15 min.	−	−	−	−	−	−	−	−	−	−	−	+
8·1	Unheated	−	+	+	+	+	+	+	+	+	+	+	+
8·1	60° C for 30 min.	−	−	−	−	−	+	+	+	+	+	+	+
8·1	80° C for 30 min.	−	−	−	−	−	−	−	−	−	−	−	+
8·1	100° C for 15 min	−	−	−	−	−	−	−	−	−	−	−	+

+ = growth of Oxford staphylococcus. − = No visible growth.

Eventually it will probably be found necessary to adopt a standard penicillinase; meanwhile a simple laboratory method of obtaining a sterile and stable product may be found useful.

Assay of penicillinase preparations.—Until a unit of penicillinase is defined and generally accepted potency determinations by different methods are not comparable and the expression of activity in terms of units of penicillin inactivated by a given volume is meaningless except within a series of comparative tests carried out by the same technique. *The following method of assay,* for which no special advantage is claimed, was used for all estimations.

A stock aqueous solution of sodium penicillin is made containing 10,000 Oxford units per ml, from which a series of dilutions in digest broth is prepared as required. The penicillinase solution to be tested is diluted 1 in 20 in broth, and 0·5 ml. added to an equal volume of each penicillin dilution. Without preliminary incubation the mixtures are seeded with one drop of an overnight broth culture of the Oxford staphylococcus. Within wide limits the actual number of organisms inoculated is immaterial. Results are read after incubation at 37° C for 24 hours, the end-point being taken as the highest concentration of penicillin to allow visible growth.

Method of penicillinase production.—Agar plates are heavily inoculated from a digest broth culture of the paracolon bacillus and incubated at 37° C for 24 hours. The growth is scraped off in a minimum quantity of distilled water, about 15 ml. of very thick suspension being obtained from 10 plates. The bacterial suspension is dried in vacuo, first over $CaCl_2$ and then over P_2O_5. The dried organisms are ground thoroughly in a dry mortar with a little powdered 'Pyrex' glass, and emulsified by the gradual addition of alkaline water (water adjusted to pH 9·5 by addition of dilute NaOH) to give a 1% suspension. The suspension is centrifuged and the supernatant fluid clarified by filtration through paper pulp. The clarifate is filtered through a gradocol membrane of average pore diameter 0·76 μ.

The resultant sterile filtrate has a reaction of approximately pH 7·4 *and an activity equivalent ranging from* 10,000 to 20,000 units of penicillin per ml. as determined by the method of assay described above. After an assay of its activity it is distributed in sterile glass phials in 1 ml. quantities, dried over P_2O_5 and sealed in vacuo. When required for use the dried penicillinase can be reconstituted by the addition of sterile distilled water. *It goes rapidly into clear colourless solution,* and, since there is no reduction of activity during desiccation and reconstitution, the volume can be adjusted to give a

uct and dried organisms.
rates can be obtained by grinding the thick bacterial suspension with alkaline water without first drying it, but extraction is much more effective after the preliminary desiccation. In one experiment 10 plate cultures of the paracolon bacillus yielded 13 ml. suspension. Of this suspension 0·5 ml. was ground very thoroughly with powdered pyrex glass and 25 ml. alkaline water, and a membrane filtrate was prepared in the usual way. The volume of the filtrate was 22 ml. The other 0·5 ml. suspension was dried to

TABLE II—THERMOSTABILITY OF DRIED PENICILLINASE

Penicillinase solutions (final dilution 1 : 40)	Heat treatment while dry	Units of penicillin in 1 ml. volumes										
		500	250	125	62·5	31·25	15·6	7·8	3·9	1·95	0·97	0
Parent filtrate	..	−	+	++	++	+++	+++	+++	+++	+++	+++	+++
Dried and reconstituted	Nil	−	+	++	++	+++	+++	+++	+++	+++	+++	+++
	100° C for ½ hr. in air	−	+	++	++	+++	+++	+++	+++	+++	+++	+++
	100° C for ½ hr. in vacuo	−	+	++	++	+++	+++	+++	+++	+++	+++	+++
	Autoclaved at 15 lb for 20 min in vacuo	−	+	++	++	+++	+++	+++	+++	+++	+++	+++

Plus signs indicate degrees of opacity due to growth of Oxford staphylococcus.

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* Working with a part-time grant from the Medical Research Council.

give 0·4486 g. of bacterial powder; this was ground without pyrex glass, and 17 ml. final filtrate obtained which was made up to 22 ml. with distilled water. The two filtrates were tested in parallel with the following result:

1 ml. "wet" preparation = 5000 units penicillin.
1 ml. "dry" preparation = 20,000 units penicillin.

Thermolability of penicillinase in solution.—Duthie (1944) found that heating a solution of *B. subtilis* penicillinase for 4 hours at 60° C produced no reduction of activity between pH 5 and pH 7 and a 50% loss at pH 8; further that "boiling for 20 minutes at neutral pH caused no alteration in activity." The experiment summarised in table I shows that paracolon bacillus penicillinase is thermolabile at acid, neutral, or alkaline reactions, being completely inactivated in 30 minutes at 80° C or in 15 minutes at 100° C. Heating to 60° C for 30 minutes causes a reduction of activity of over 90% and the tests at this temperature indicate, in contrast to Duthie's results, greater stability at pH 8·1 than at pH 5·9. Numerous experiments have given entirely concordant results; even 5 minutes at 100° C has invariably produced complete inactivation of our preparations, while heating at 56° C for 30 minutes has led to at least 50% reduction. It is obvious therefore that filtrates are quite unsuitable for long storage, transport, or purposes of standardisation.

Thermostability of dried penicillinase.—Dried penicillinase, unlike penicillinase in solution, is very thermostable. Sealed phials containing dried filtrate were totally immersed in boiling water for 30 minutes and one phial was autoclaved for 20 minutes at 15 lb. pressure. The samples, together with an unheated one, were reconstituted by the addition of water to the original volume and then tested in parallel with the parent filtrate. The results given in table II show that there was no reduction of activity either from drying and reconstitution or from any of the heat treatments. One of the phials immersed in boiling water was filled with dry air before sealing in order to provide a heat conductor and to test thermostability in the presence of oxygen.

DISCUSSION

It has been generally assumed that paracolon bacillus penicillinase is not dissociable to any great extent from the bacterial cells. Membrane filtrates of digest broth cultures do contain penicillinase in low concentration, but attempts to increase the yield by prolonging duration of growth, and by leaving cultures for several days to allow autolysis to occur, were unsuccessful. For a time we obtained extracts from the acetone and ether treated bacterial powder of Harper in the belief that the ether treatment was necessary to permit free release of penicillinase through the cell membrane, but it was subsequently found that even more potent extracts could be obtained by the technique described above without any preliminary treatment of the bacteria other than simple desiccation. It is probable that the desiccation serves merely to promote a much more thorough disintegration of the bacterial cells than can be attained by grinding in the wet state, even with the aid of an abrasive like powdered glass. The penicillinase of *B. subtilis* studied by Duthie is apparently much more readily dissociated from the cells; this together with the discrepancies between his results and our own in respect of filterability and thermostability strongly suggest that different penicillinases are synthesised by different bacterial species.

The thermostabilities of the paracolon penicillinase in liquid and in dry form are in striking contrast. The fact that decreases of penicillin in geometrical progression were used in the tests recorded in table II might be considered to obscure reductions of activity up to 50%. The strictly comparable gradations of turbidity in each row however indicate that no appreciable reduction did in fact occur in any test. The sparser growth in mixtures near the end-point is a constant phenomenon, due to the fact that neutralisation or inactivation of penicillin by penicillinase is a progressive reaction, so that, with approximately balanced reagents, growth is inhibited by free penicillin for a considerable time. On prolonged incubation maximum turbidity is eventually attained in all tubes which show any growth at all. In unpublished experiments we have found that "neutral" mixtures can be reactivated by simple dilution in broth for at least 2 hours after the reagents are brought together, but not after 24 hours. This dilution phenomenon is of course well known in the cases of toxin-antitoxin and virus-antibody reactions, and suggests that the reaction occurs in two stages—a loose reversible combination succeeded by firm irreversible union or possibly by degradation of the penicillin.

SUMMARY

A method of obtaining dry stable and sterile penicillinase from a paracolon bacillus is described.

The dry preparation can be quickly reconstituted by the addition of water to give a clear sterile solution of known potency.

The penicillinase has a high degree of thermostability when dry, showing no reduction of activity after being heated to 100° C for 30 minutes or 120° C for 20 minutes. In solution it is totally inactivated by 80° C for 30 minutes or 100° C for 5 minutes, and suffers a 90% reduction in 30 minutes at 60° C.

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ILIAC HERNIA AFTER BONE-GRAFTING

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THE ilium has become a quarry for the supply of all types of bone-graft to the face and skull. Rib cartilage has fallen into disrepute because it tends to curl some months after insertion and because pain at the donor site is so severe just after operation. During 2½ years in the Middle East we used iliac bone for grafting on 56 occasions. Until 1944 we had not noticed any serious effects at the donor site. Early in that year, however, one of our patients was found to have a landslide hernia of the cæcum through a bone defect in the right iliac crest, following a graft.

CASE-HISTORY

A stout man, aged 52, was treated between February and July, 1943, by a succession of 3 iliac bone-grafts for the repair of an extensive bone loss of the margins of the orbit and malar region, the result of a motor accident.

At the first operation (Feb. 24, 1943) a full thickness block of bone 2 in. by 1½ in. by ⅓ in. was removed from the right iliac crest. This block was carved to the shape of a model previously made to represent the right malar bone. The graft was then inserted through a temporal incision into a pocket made for it beneath the cheek. At the second operation (May 23) a small half-thickness block of bone, 1 in. by ½ in., was removed from the left iliac crest to fill a defect in the right supra-orbital margin. At the third operation (July 21) another small half-thickness block of bone, ¾ in. by ½ in., was removed from the right iliac crest just in front of the defect resulting from the first operation. This bone was used to elevate the infra-orbital margin which was still depressed.

On Jan. 9, 1944, when the patient returned for a periodic review of his grafts, he asked if his side could be examined because he had noticed a lump beneath his "first scar." The swelling had been there about a month and had gradually increased. It had caused no pain and it disappeared when he pressed his hand on it or lay on the opposite side. There was no aching or dragging pain over it, no sickness or bowel irregularity, and his normal activities had not been affected in any way.

With the patient standing, a protrusion was seen in the right flank just below the normal level of the middle third of the iliac crest (fig. 1). The swelling was soft, oval, and well-defined, and was about 2½ in. in its greatest diameter; it was attached to the deep tissues but not to the skin. It was resonant on percussion, and there was an impulse on coughing. It was easily reducible and a gurgle could sometimes be appreciated when reduction occurred. The neck of the hernial orifice was about 1½ in. in diameter and almost circular. Below and on each side, the margins were hard but rounded, and appeared to be bony; whereas a fibrous bar seemed to form the upper margin. The patient was admitted to hospital. Fig. 2 shows the X-ray appearances.

On Jan. 12, with the patient under spinal anæsthesia (14 c.cm. light 'Nupercaine' 1/1500 between the 3rd and

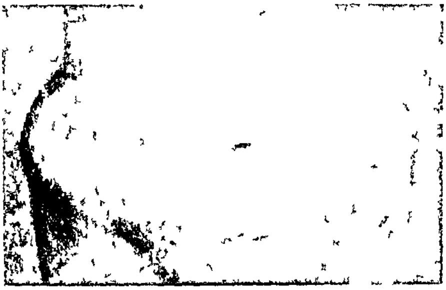

Fig 1—Swelling caused by landslide hernia of the cæcum through an iliac defect after bone grafting

Fig 2—Radiogram showing defect in right iliac crest and herniation of the bowel through it

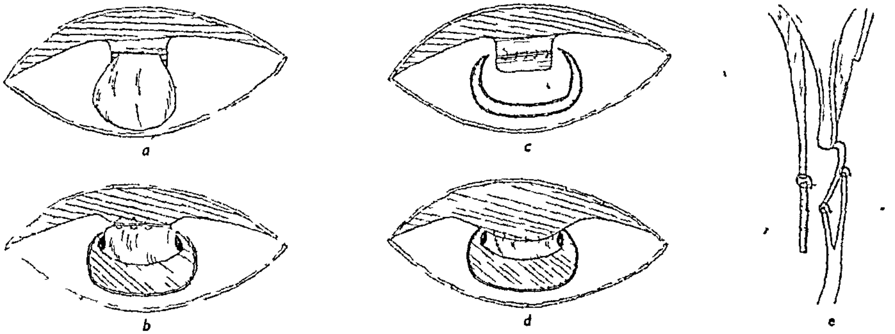

Fig 3—Operation a b c and d stages in the repair of the iliac defect by fascial flaps and grafts e vertical section of abdominal parietes after repair of hernial orifice

4th lumbar vertebræ), a curved incision, about 8 in long, was made over the swelling in the right iliac region and the scar resulting from the first operation was excised. The hernia was defined and all adhesions to it were divided as far as the neck. It was found then to be a landslide hernia of the cæcum (fig 3a). The neck was freed from the adhesions connecting it to the rim of the hernial orifice and the retroperitoneal tissues internal to this. The cæcum was pushed back into the abdomen and when this had been done a fairly large oval slit was found in the iliacus muscle just internal to the bony defect. The edges of the torn iliacus were defined and the rent was repaired by overlapping catgut sutures (fig 3b). The lower and lateral margins of the neck proper were formed by the rounded edges of the iliac bone defect, while the upper margin was formed by the fused rolled lower edges of the external and internal oblique and transverse abdominal muscles. This roll of tissue was separated into two layers the outer formed by the external oblique and the inner one by the internal oblique and transverse abdominal. In order to make a strong aponeurotic flap to turn upwards to cover the bony defect, a long semilunar incision was made in the aponeurosis which covered the glutei over the intact outer surface of the ilium, below and upon each side of the hernial orifice. This gluteal aponeurosis was attached firmly to the ilium at the lower and lateral margins of the bony defect. After separating the peripheral portion of the flap from the glutei beneath it, a trap-door of strong fibrous tissue, hinged upon the lower and lateral margins of the body defect, was turned over and upwards. It was then sutured to the lower free border of the internal oblique and transverse abdominal (fig 3c) by fascia lata strips reinforced by interrupted no 2 chromic catgut stitches. The fascial sutures had previously been taken from the right thigh through a 3 in transverse incision in the lateral part of the lower third by means of a Masson's fasciatome (fig 4a, b, and c). The free lower margin of the external oblique was brought down over this suture line and stitched to the outer raw surface of the trap door aponeurotic flap thus an imbrication was made to reinforce it (fig 3d). The deep and superficial fascial layers were repaired by interrupted fine catgut stitches and the skin was closed (fig 3e) after inserting a small tube in the lower margin of the wound to prevent hæmatoma formation. The tube was removed 48 hours afterwards and a fair amount of blood and serum was found to have drained through it.

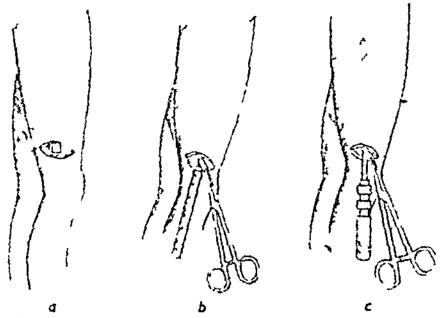

Fig 4—a b and c stages in removal of the fascial strip from the thigh by Masson's fasciatome

The patient was kept in bed 4 weeks and during the last 2 weeks he did graduated exercises to strengthen his abdominal and iliacus muscles. When he started to walk again, at first flannel spica bandage was used to support the iliac region and a crêpe bandage to support the fascia lata defect in the right thigh. The patient spent 2 weeks at a convalescent home and then returned for discharge to base. On June 4, 1944, the iliac hernia appeared to have been cured. It is not certain that a radical and permanent cure has been effected, but the patient is now back at his work and suffers no disability.

SUMMARY

In a series of 56 iliac bone-grafts for repair of bony defects of the face, one patient was found to have a landslide hernia of the cæcum through a defect in the right iliac crest. This had been used on two occasions as a donor site for bone-grafting.

The defect was repaired by suturing a slit in the iliacus muscle and a "turnover" gluteal flap reinforced by fascia lata sutures to protect the bony defect.

TROPICAL EOSINOPHILIA

AS SEEN IN ENGLAND

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SINCE we published the first case of "tropical eosinophilia" recorded in England (Apley and Grant 1944) we have treated 3 additional cases and a possible fourth. All 5 occurred among 114 consecutive chest cases in men invalided back to England from the East, and only in these 5 was there a well-marked blood eosinophilia. It is evident that this condition must now be included in the differential diagnosis of patients returning from overseas with chest complaints.

Of the 109 cases without eosinophilia, all but 16 gave a previous history of chest trouble. Their deterioration, to an extent sufficient to warrant repatriation, confirms the generally held impression that such cases do badly in the tropics. 96 were cases of bronchitis or asthma or a combination of both; the remainder formed a miscellaneous group comprising old tuberculous lesions, bronchiectasis, &c.

EOSINOPHILIA WITH PULMONARY DISEASE

The combination of eosinophilia and pulmonary lesions is common to many conditions such as Loeffler's syndrome, tropical eosinophilia, periarteritis nodosa, bronchial asthma, and some intestinal infestations. With regard to Loeffler's syndrome (Loeffler 1936) and tropical eosinophilia (Weingarten 1943), we suggested in a previous paper (loc. cit.) that their differentiation was more apparent than real, and that the gradation between cases illustrating the two conditions renders it more profitable to consider them as the manifestation of one type of disease process. The remaining examples of what may be termed the "EP syndrome" support the contention that in all we are considering only end-results, similar in many respects, though not necessarily evoked by the same agents.

Tropical eosinophilia is now of practical importance in this country. It is not only becoming increasingly common but it can be cured. Is it due to a specific arsenic-sensitive organism, or is it a manifestation of an allergic response common to a variety of allergens?

If it is in fact caused by a specific organism there are at present only the most incomplete clues to its identity. It has been suggested that there is a relationship to infestation with mites (Carter et al. 1944), but mites in themselves do not appear to be the direct cause. Thus, mites may be found in the sputum in the absence of the EP syndrome, and the EP syndrome, curable by arsenic, may occur in the absence of mites even after the most exhaustive search (Soysa and Jayawardena 1945). The sputum of our last two cases, examined after the publication of the work incriminating mites, also contained no mites. Mites have also been found in the intestine in the absence of demonstrable disease (Manson-Bahr and Muggleton 1945). Mites may perhaps be classed with other organisms capable of producing the EP syndrome, such as *Entamœba histolytica* (Hoff and Hicks 1942) and *Fasciola hepatica* (Lavieri et al. 1939). They may be one of the many allergens producing a common syndrome, or may be occasional vectors of a specific agent which can also invade the body without their agency.

It will be seen that cases 4 and 5 in our series differ considerably from each other. Despite the similarities, the well-marked contrast in the bone-marrow reactions makes it most unlikely that these cases are examples of the same disease. All 5 of our cases fit in with Weingarten's (1943) description of tropical eosinophilia, but by no means completely. Thus, in none were the characteristic X-ray changes seen, and in none was splenic enlargement found.

Loeffler's syndrome is not always distinguishable from tropical eosinophilia. Loeffler's syndrome occurs, however, in dry climates, compared with the humid climate in which tropical eosinophilia usually originates. All our cases of tropical eosinophilia showed symptomatic improvement in the temperate climate of England, and this observation applies equally to our cases of bronchitis and asthma.

Intestinal infestation may also produce the EP syndrome. Such a causal connexion has been demonstrated on occasion in cases of infestati [illegible] *F. hepatica*, and possibly *Ascaris* [illegible] 1939). Certainly the EP syndrome is extremely rare in these infestations, but its more usual absence may be analogous with the state in which harmless mites are present in the intestine.

Bronchial asthma forms the largest group of the EP syndrome. In all our cases some such diagnosis was, in fact, originally made. In bronchial asthma the degree of eosinophilia varies greatly (Herrick 1911) but is usually about 6% (Brown 1927). Cases of asthma associated with transitory pulmonary infiltration and pleurisy, with a markedly eosinophilic effusion, have been described (Harkavy 1941). One of us (J. A.) has recently had a case of transient migratory pneumonitis with effusion, in which the blood-count was normal but the effusion contained 55% of eosinophils. Such a case appears to form a further link in the series. Harkavy (1941) considers his cases to be formes frustes of periarteritis nodosa, and in one of them a typical lesion eventually developed.

Periarteritis nodosa.—Among the characteristics of this condition the occurrence of attacks of bronchial asthma is striking. A high blood eosinophilia also occurs in most cases (Middleton and Carter, cited by Tissell 1941). Transitory pulmonary infiltration may be seen radiologically (Elkeles 1944), and lung lesions have been demonstrated post mortem, as in 5 of 7 consecutive cases by Glynn (1944). The significance of the successful treatment of periarteritis nodosa with arsenic, described over twenty years ago (Carling and Hicks 1923) and confirmed since, now becomes more apparent. Recent work strongly suggests that periarteritis nodosa is one manifestation of an allergic type of hypersensitivity (Rich 1942), and the similarities tend to the conclusion that this applies to all groups of the EP syndrome.

Some outstanding queries.—The problems arising from the study of the EP syndrome, and particularly of tropical eosinophilia, will probably be solved in countries where cases are encountered in comparatively large numbers and at an early stage, but already some may be posed. What is the effect of arsenic on eosinophilia in unrelated conditions? Does climate play a part in chronicity? May the syndrome be associated with mites in non-tropical as well as in tropical countries?

TROPICAL EOSINOPHILIA IN ENGLAND

The case-histories of our five patients are tabulated for brevity and ease of comparison. (Case 1 has been more fully reported elsewhere; Apley and Grant 1944.) Case 5 was originally only tentatively included because of the comparatively low eosinophilia, the dubious geographical conformation, and the previous allergic history. The startling difference between the sternal puncture result in this case, as compared with the otherwise more typical case 4, suggests strongly that we are here dealing with a different disease.

To exclude other conditions, the following investigations were carried out in all cases: repeated chest radiograms and blood-counts, examination of all stools for three days after vermifuge (repeated), sputum examinations, muscle radiograms (calcified cysts), midstream and terminal urine examination after prostatic

SUMMARY OF CASE-REPORTS

Case no.	1	2	3	4	5
Previous history	Pneumonia; winter bronchitis	Nil	Nil	Nil	Hayfever; "weak chest" in childhood
IN THE TROPICS					
Time over-seas ..	19 months	15 months	10 months	20 months	6 years (with intervals)
Onset of disease	E. Bengal	Calcutta	India	Assam, after India	China, after 2 days in Ceylon
Intvl. O/S before onset ..	3 months	3 months	1 month	11 months	3 months
Symptoms* ..	Cough and wheezing, worse at night, with loss of weight				
Diagnosis ..	Bronchitis	Bronchitis and asthma ? tropical eosinophilia	Bronchitis	Asthma	Bronchial asthma
X-ray chest ..	Congestion and opacity	Nil after 6 months	Not taken	Not taken	Not taken
Blood-count ..	Not taken	28% eosinophils, after 6 months	Not taken	Not taken	Not taken
ON RETURN TO ENGLAND					
Age in years ..	37	21	29	16	24
Signs	Nil in chest	Nil in chest	Nil in chest	Nil in chest	Nil in chest
X-ray chest ..	Chronic bronchitis	Normal	Small opacity L. upper zone, clearing to leave linear scar	Normal	Normal
Blood eosinophils per c.mm. ..	1410 (16%) to 420 (7%)	540 (9%)	960 (12%)	2880 (32%)	675 (15%)
Exacerbation ..	After 3 weeks: clinical bronchitis; eosinophils 6400 (10%)	After 6 weeks: clinical bronchitis and asthma; eosinophils 1200 (10%)	After 7 weeks: clinical bronchitis; eosinophils 1170 (9%)	Nil in 8 weeks before treatment	Nil in 3 weeks before treatment
2 weeks after NAB course	Symptom-free. Eosinophils 300 (6%); 6 mths later 80 (1%)	Symptom-free. Eosinophils 300 (5%)	Symptom-free. Eosinophils 400 (8%) — 360 (4%) after 3 mths	Symptom free. Eosinophils 226 (2%)	Symptom-free for first time in 6 yr. Eosinophils 243 (3%)
Notes	Seborrhœic dermatitis in India. *Trichomonas hominis* in stools after vermifuge (England)	In India after carbarsone eosinophils rose to 59%; fell to 12% after NAB. Asthma attacks after NAB. *Tr. hominis* in stools after vermifuge (England)	..	Sternal puncture before treatment: pronounced eosinophil reaction in marrow (eos. myelocytes 11%; eos. polymorphs 20%)	Sternal puncture before treatment: pronounced erythropoietic hyperplasia (eos. myelocytes 2%; eos. polymorphs 3%)

* These continued after the patients' return to England.

and Natarajan 1945), and mites were sought for in the sputum of the last 2. All the above gave negative results.

Clinical features.—In the small number of cases studied by us in this country the chronic phase of tropical eosinophilia is characterised by:

(1) Cough and wheeziness, invariably worse at night.

(2) [illegible]

(3) [illegible] eosinophilia is almost invariably much lower, and is said to fall during recrudescences (Bray 1937).

(4) Possible persistence of X-ray findings (opacity or scar) many months after the onset (1 case).

(5) Complete response to organic arsenicals, both symptomatically and in the degree of eosinophilia, though the alteration in the latter may be delayed.

Treatment.—In patients returning to this country with tropical eosinophilia the question of selection of cases answers itself. When a differential diagnosis rests between a curable and an incurable condition the former must be assumed for the purpose of treatment. Such suggested criteria as the absence of a related past history or of confirmatory findings at the onset of the disease should not be permitted to outweigh the advantages of treatment with arsenic.

The treatment we employed consisted of three injections of 0·3 g. of neoarsphenamine followed by three injections of 0·15 g., given intravenously with ascorbic acid and calcium gluconate, at 3–4 day intervals. From such a short course toxic effects would not be anticipated, nor did any develop in our cases. Symptomatic response usually occurs towards the end of the course, or within a few days of its cessation. The eosinophilia may fall markedly within 14 days of cessation, but may fall more slowly and continue to fall for several weeks. During treatment the eosinophilia is invariably raised.

With so few cases it was not possible to use any as controls.

SUMMARY

The combination of eosinophilia with pulmonary disease, known variously as tropical eosinophilia, Loeffler's syndrome, &c., is probably an allergic manifestation, an end-result arising from a variety of allergens.

Five case-histories are tabulated of men returning from the tropics wit[illegible] fered is so many res[illegible] picture, as to suggest [illegible] others.

All 5 cases responded, by complete clinical cure and fall of blood eosinophilia, to a short course of neoarsphenamine injections.

We are indebted to Air Commodore T. C. St. C. Morton for his cooperation, to Captain A. G. Apley for his criticisms, and to Dr. L. E. Glynn for reporting on the sternal puncture smears.

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[illegible] and Hicks).

[illegible] i.

FIELD METHOD FOR DIRECT ESTIMATION OF MEPACRINE IN PLASMA AND BLOOD

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A MODIFICATION of the Masen (1943) technique has been worked out to enable the direct estimation of mepacrine in plasma or whole blood to be performed under field conditions.

Special apparatus required.—Portable visual fluorimeter, consisting of a boxed-in mercury light, with a trench or holes for test-tubes screened by Wood's glass which lets through the ultraviolet and no visible light; separating funnel (100 ml.); non-fluorescent test-tubes (e.g., Chance's 'Hysil,' 5/8 × 6 in.); small electric or hand centrifuge.

Glassware should be kept scrupulously clean, and should be left in cleaning solution each night.

REAGENTS

0·3N.NaOH. Petroleum ether.

Redistilled isopropyl alcohol and redistilled isobutyl alcohol mixed in equal proportions.

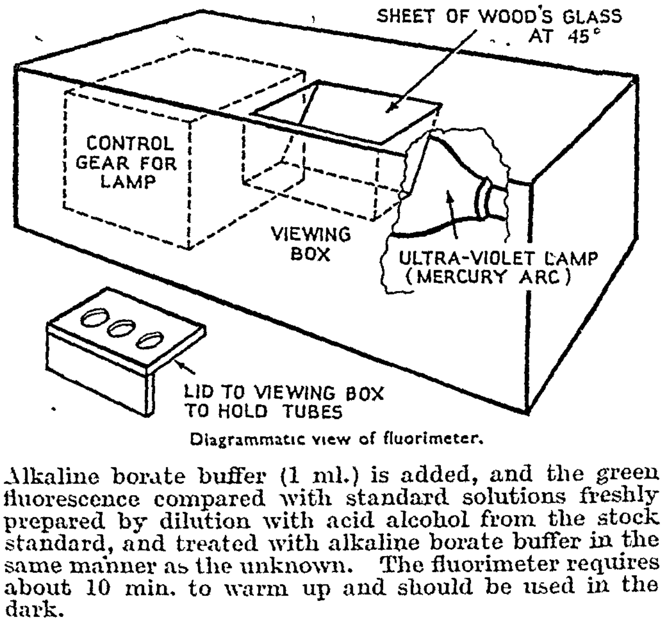
30% solution of isopropyl alcohol in 0·1N.HCl.

Standard mepacrine solution (one mepacrine tablet of 0·1 g. shaken up in a litre of 0·1N.HCl). This solution should be prepared monthly and should be kept in a dark place.

Borate-NaOH buffer (4 g. of sodium borate in 100 ml. of 1·35N.NaOH, filtered).

METHOD

In a separating funnel are placed 10 ml. of 0·3N.NaOH, 25 ml. of petroleum ether, and 25 ml. of the isopropyl-isobutyl alcohol mixture; 5 ml. plasma (potassium-oxalate or citrate, or heparin), or 5 ml. whole blood is added and the mixture shaken vigorously for 1 min. and then allowed to separate. The blood layer is discarded. The mixture is washed with 10 ml. of 0·3N.NaOH by shaking vigorously for 1 min., and the NaOH discarded. The NaOH wash is repeated twice and the NaOH layer separated as completely as possible. The mepacrine is next extracted into 5 ml. of the acid alcohol mixture by shaking vigorously for 1 min. After it has separated out, the acid layer is run off into a centrifuge-tube and spun clear. 4 ml. of the clear solution is pipetted into a non-fluorescent test-tube. Alkaline borate buffer (1 ml.) is added, and the green fluorescence compared with standard solutions freshly prepared by dilution with acid alcohol from the stock standard, and treated with alkaline borate buffer in the same manner as the unknown. The fluorimeter requires about 10 min. to warm up and should be used in the dark.


SHEET OF WOOD'S GLASS AT 45°
CONTROL GEAR FOR LAMP
VIEWING BOX
ULTRA-VIOLET LAMP (MERCURY ARC)
LID TO VIEWING BOX TO HOLD TUBES

Diagrammatic view of fluorimeter.

Standards.—The standard mepacrine solution contains 100 mg. per litre. A dilute standard solution is prepared by diluting 10 ml. of the strong standard to 1 litre with 0·1N.HCl. This solution should be prepared freshly for use. Fluorescent standards are prepared as follows: 0·1 ml., 0·2 ml., 0·4 ml., 0·8 ml., and 1·2 ml. dilute standard are each diluted to 5 ml. with the acid alcohol mixture; 4 ml. of each of these is treated with 1 ml. NaOH-borate buffer. These are equivalent to 20 µg., 40 µg., 80 µg., 120 µg., and 240 µg. per litre respectively. Additional standards of intermediate strengths may be prepared if it is desired to match the blood strengths more closely. For very high mepacrine concentrations, 2 ml. of whole blood may be used instead of 5 ml. For very low plasma concentrations, 10 ml. should be used instead of 5 ml.

The *fluorimeter* (see figure) is used on a 220–240 volt AC circuit. It should be turned on about 10 minutes before use. The blood fluorescent tube is placed between two standards for matching. The tubes may be viewed vertically, by placing them in the holes of the rack provided, or they may be viewed horizontally by removing the rack and placing the tubes in the well. Once the lamp has been switched off, it must not be used again until it has cooled down. It should, therefore, be kept on continuously until each set of matchings has been completed. Suitable lamps are the 'Osira' 80 watt black glass lamp, 230 volt, with choke, as GEC leaflet 05 7196, or Philips's MBW-V 'Philora' ultraviolet mercury lamp with lampholder and choke. The whole apparatus, in a convenient assemblage and readily portable form, may be obtained from The Tintometer Ltd., Milford, Salisbury, at an approximate cost of ten guineas.

This method has been developed at the suggestion of the chemical and pharmacological subcommittee of the Malaria Committee of the Medical Research Council. An expenses grant from the MRC to defray the costs of the investigation is gratefully acknowledged. We should also like to thank Mr. G. S. Fawcett and Mr. W. Weedon for their valuable assistance in making the fluorimeter.

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DECOMPOSITION OF TRILENE IN CLOSED CIRCUIT ANÆSTHESIA

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A NUMBER of fatal cases have been reported following 'Trilene' (trichlorethylene) anæsthesia using the closed circuit technique. Our investigations into the cause of two deaths following such anæsthesia disclosed that the trilene had undergone decomposition while in contact with soda lime in the apparatus, and further work was started to discover the extent of decomposition and the substances produced.

Shortly after these two reported deaths Carden (1944) recorded the risks of trilene when used with a closed circuit apparatus, and gave the results of analyses done by Dr. H. E. Cox showing that decomposition was affected by the composition of the soda lime. Cox also noted the presence of the breakdown products, dichloracetylene and phosgene. Some conditions affecting the formation of trilene decomposition products have now been examined.

Study of published work shows that one of the best methods of preparing dichloracetylene is to pass trilene vapour over heated alkali. The conditions for maximum yield—i.e., maximum trilene decomposition—given by Ott and Packendorff (1931) were obtained by using granulated potassium hydroxide at a temperature of 130° C. Had such properties of trilene been realised, it is certain that it would never have been used in closed circuit anæsthesia including soda lime—that is, under conditions approaching those needed for a good yield of decomposition products.

Trilene (trichlorethylene) decomposes in contact with alkali, the first stage being the removal of hydrochloric acid to form dichloracetylene:

$$\begin{array}{c}\mathrm{CH\,Cl}\\ \|\\ \mathrm{C\,Cl_2}\end{array} \xrightarrow{\mathrm{NaOH}} \begin{array}{c}\mathrm{C\,Cl}\\ |||\\ \mathrm{C\,Cl}\end{array} + \mathrm{HCl}\ (\text{absorbed by NaOH})$$

In such a reaction dichloracetylene can be produced in the absence of air, and in fact it is unstable, being spontaneously inflammable in contact with air, with the production of phosgene and carbon monoxide and possibly carbon dioxide.

$$\begin{matrix}\mathrm{C\,Cl}\\ |||\\ \mathrm{C\,Cl}\end{matrix} + O_2 \longrightarrow CO\,Cl_2 + CO$$

Possible decomposition products in the presence of moisture are dichloracetylchloride and trichloracetyl- [illegible] would produce the cor- [illegible] products other than the [illegible] toxic from their chemical [illegible]

Excess of trilene vapour stabilises dichloracetylene to a certain extent. The presence of ether also has a stabilising effect, a loose molecular compound being formed. These stabilising effects would account for the apparent paradox of a spontaneously inflammable substance being detectable in the presence of air in an anæsthetic apparatus.

EXPERIMENTAL STUDIES

—First experiments were carried out with trilene without soda lime. It was found that trilene was not appreciably decomposed by moisture or oxygen at temperatures up to 45° C. It seems then that from the standpoint of chemical decomposition trilene is perfectly safe to use under all normal circumstances when out of contact with alkali.

The remaining experiments included the use of soda lime under varying conditions.

Alkalinity of the soda lime.—Commercial brands of soda lime vary considerably in caustic soda alkalinity. In a previous investigation Cox found that one sample contained nine times as much caustic soda as a second sample tested. In various brands on sale that we analysed the total sodium alkalinity, calculated as Na_2O, ranged from 1% to 21%. Experiments showed that a higher sodium alkalinity corresponded relatively to a higher rate of trilene decomposition.

Contact of trilene with the soda lime.—Two factors may be mentioned. Theoretically the granule size of the soda lime should have an effect. Smaller particle-size means [illegible] nd should indicate [illegible] ned in practice but [illegible] trilene passed at a [illegible] soda lime showed [illegible] factors in the soda [illegible] rage sample—was chosen for all further work. Analysis showed that this contained 13% total sodium alkalinity (as Na_2O) and lost 10% of its weight when dried at 100° C. Another advantage of this brand was its freedom from chloride, which would complicate the determination of chlorine resulting from trilene decomposition.

Experiments at room temperature (15° C).—Air con- [illegible] (ammoniacal copper nitrate containing hydroxylamine). [illegible] a red precipitate of copper [illegible] of acetylene derivatives (e.g., [illegible] ach experiment was so regulated that approximately 1 gramme of trilene vapour passed over 10 g. of the soda lime during one hour. The soda lime tubes were kept at 15° C by immersion in water, and at the er [illegible] trilene was determine [illegible] and weighing. The [illegible]

1. Trilene over soda lime: slight copper acetylide precipitate but not in measurable amount; chloride in soda lime equivalent to 0·006 g. AgCl.
2. Trilene over soda lime moistened with distilled water (we were informed that soda lime in absorption containers has on occasion been moistened with water to prevent dust being carried into the apparatus): no copper acetylide precipitate; chloride equivalent to 0·015 g. AgCl.
3. Trilene over soda lime dried at 100° C for one hour: strong copper precipitate; chloride equivalent to 0·025 g. AgCl.
4. Trilene, to which 20% of ether had been added, over soda lime (as in experiment 1): no copper precipitate; negligible chloride.

[illegible] lime at [illegible] decom- [illegible] ment 3, [illegible] trilene vapour had been decomposed. The presence of ether appears to have a stabilising effect on the trilene in accordance with theory.

Soda lime containers of anæsthetic machines are known in practice to develop heat. Experiment with a closed circuit anæsthetising machine showed that a temperature of 60° C. could be reached after half an hour's working. The effect of the temperature on the decomposition of trilene was therefore studied. The conditions and apparatus (1 g. trilene over 10 g. soda lime in one hour) were the same as for experiments 1–4 except that the soda lime tubes were immersed in water at temperatures from 15° to 75° C.

5. Trilene over soda lime:

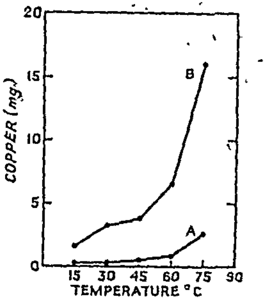
Temperature (° F) ..	15	30	45	60	75
Copper equivalent of acetylide precipitate (mg.)	0·18	0·30	0·50	0·91	2·50

6. Trilene over soda lime moistened with distilled water: no copper acetylide precipitated at any temperature up to 75° C.
7. Trilene over dried soda lime:

Temperature (° F) ..	15	30	45	60	75
Copper equivalent of acetylide precipitate (mg.)	1·3	3·2	3·8	6·4	16·0

8. Trilene, to which 20% of ether had been added, over soda lime (as in experiment no. 5) gave no copper precipitate at temperatures of 15°–45° C, a slight but not measurable precipitate at 60° C, and a precipitate equivalent to 0·1 mg. copper at 75° C.

In the figure, where these results are shown graphically, the large increase in temperature effect above 60° C can be seen. The greater reactivity of dried soda lime is shown and the stabilising effect of ether at higher temperatures is also apparent. Perhaps the most interesting point is the complete absence of dichloracetylene at any temperature when moistened soda lime is used. This is not due to lack of decomposition of the trilene, for the soda lime showed the presence of increased chloride. The most probable explanation is that the dichloracetylene is hydrolysed by the soda lime in situ, or simply that the trilene is hydrolysed instead of being converted to acetylene derivative.



Effect of temperature of soda lime on the production of dichloracetylene (as mg. copper from copper acetylide). A, Soda lime. B, Soda lime dried at 100° C

General comparison of the [illegible] ment [illegible] the s [illegible] acetylene detected. This means that in nearly every case further decomposition of some acetylene derivative takes place.

In experiments producing appreciable amounts of dichloracetylene there was always a minor explosion if air was admitted to the apparatus in disconnecting at the end, and phosgene could then be detected. In nearly every experiment the trilene showed a detectable [illegible] a lime. [illegible] ime had been [illegible]. A peculiar [illegible] be phosgene. Symptoms lasting for 30 hours preceded death in one case. This may possibly be explained by ether stabilisation of dichloracetylene, with subsequent slow release of dichloracetylene in the system. The soda lime in the container weighed 95 g. and contained chloride equivalent to 1·16% (as AgCl). Assuming the first stage of decomposition, this represents the decomposition of approximately 1 g. of trilene.

SUMMARY

Trilene undergoes decomposition in the presence of soda lime, producing, among other substances, dichloracetylene and phosgene.

This decomposition occurs at room temperature but is greatly increased as the temperature rises.

The presence of moisture affects the decomposition products, little dichloracetylene being formed. Ether retards the decomposition of trilene over soda lime and stabilises the dichloracetylene produced.

General results show that trilene should on no account be used as an anæsthetic in the presence of any alkaline carbon-dioxide absorbent.

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EXTRAORAL PIN FIXATION FOR FRACTURED MANDIBLE

AN IMPROVED APPARATUS

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SQUADRON-LEADER RAFVR

EXTRAORAL pin fixation for fractures of the mandible, where the absence of teeth or position of the fracture prevents simpler methods of fixation being used, is now a well-established method. Various types of apparatus, of which the Clouston-Walker is perhaps the best known, have been evolved, and the type of apparatus used in this unit was described [1] in 1941. Since then experience with a large number of cases has brought to light limitations and defects in the apparatus, although the principle itself still remains of the greatest value in the treatment of difficult cases.

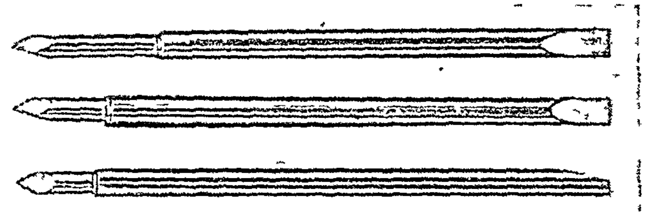

Fig. 1—Shouldered pins of 3 mm diameter with three lengths, $\frac{5}{16}$, $\frac{3}{8}$, and $\frac{5}{8}$ in., of narrow neck of 1 5 mm diameter, meeting the broader part of the pin in a sharp shoulder.

The pins originally used for insertion into the mandible were Kirschner wires of 1 5 mm. diameter, made of plated steel, sharpened at the points. The danger of these pins, particularly where the method of fixation demanded that they should be attached to an intraoral cap splint by bars and universal joints, has been pointed out by MacGregor and Fickling.[2] Destruction of the pin by electrolytic action was followed by severe ulceration of the tissues around the point of insertion of the pin from the liberation of iron ions, and in three cases described by them local necrosis of bone and delayed healing ensued. This complication was eliminated by the use of insulators in the system of connecting rods and joints, but it was then found that the diameter of the pins was not sufficiently great to stop the pins springing if they were subjected to torsional strain.

In many cases, where, owing to the position of the fracture, the muscular forces tending to displace the bone fragments were not great, good results could be obtained. Where, however, powerful muscular forces came into play—e.g., with a bilateral fracture of the body of the mandible with downward tilting of the anterior fragment due to the pull of the tongue muscles—the pins were not strong enough to prevent bowing under this strain, with consequent displacement of the bone fragments after reposition. In addition to the pin fixation, therefore, if anterior teeth were present the anterior mandibular fragment had to be fixed to the maxilla to prevent its displacement downwards. One of the advantages of the pin-fixation method—that the patient could open his mouth to eat and clean the oral cavity—was thereby lost. If no anterior teeth were present, extensive additional methods with circumferential wires, plaster head-caps, &c., were found necessary.

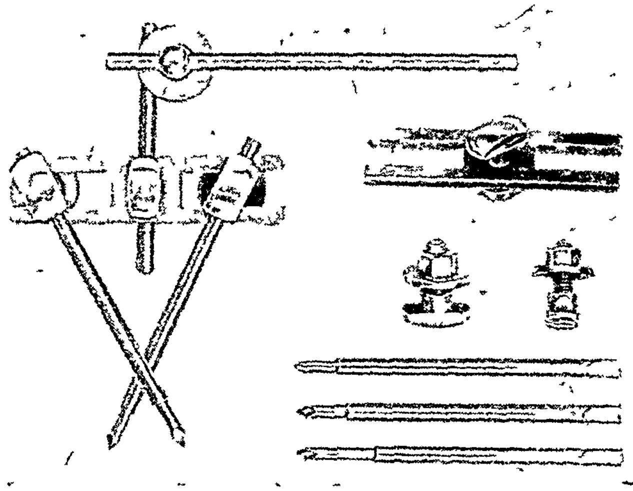

Fig. 2—Clamp and pins assembled and dismantled to show method of fixation.

THE NEW APPARATUS

It was decided that a stronger form of apparatus was needed, if it was to be universally applicable without adjuvant methods in difficult cases. The new apparatus is made entirely of stainless steel, to remove any possibility of electrolytic action due to swollen tissues or leaking blood or serum coming into contact with dissimilar metals. The pins are of 3 mm. diameter, save for the portion entering the bone, which is 1·5 mm. in diameter. This narrower part of the pin, ending in a sharp point, is made in three different lengths—5/16, 3/8, and 5/8 in.—to suit different thicknesses of bone, the choice of pin depending on the region of the mandible in which it is to be employed. The juncture of the narrow and wide parts of the pin is in the form of a sharp shoulder (fig. 1), so that when the pin is inserted into the bone with a surgical hand-drill the soft tissues deep to the mandible cannot be endangered by the pin suddenly slipping through the bone. The clamps employed are larger than the previous ones and are open ended for ease of manipulation when attaching the pins (fig. 2). The clamps are attached to each other or to the intraoral cap splint by a system of bars and universal joints in the ordinary way (fig. 3).

The apparatus, made for us by Messrs. Down Bros., Ltd., has been very satisfactory in use. The pins and clamps are strong enough to withstand the torsional strains encountered, and in a difficult case it is now possible to replace the central fragment in good alignment against the pull of the tongue muscles, and to keep it there without resorting to any accessory methods. The scars left by these thicker pins are no more obvious than those from the thinner pins, and a far more positive control over the bony fragments is obtained in all cases.

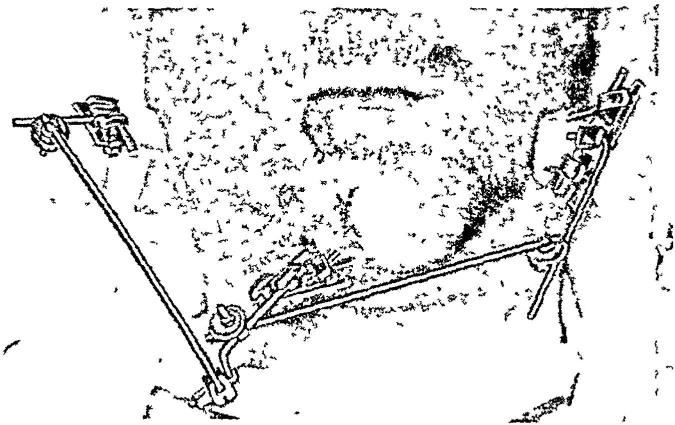

Fig 3—Apparatus in position in a patient with difficult bilateral fractures of the mandible, showing absence of any support other than the pin appliance.

I would like to thank my colleagues of the Hill End EMS Hospital maxillo-facial unit, particularly Mr. Rainsford Mowlem, Mr. J. L. Dudley Buxton, and Mr. B. W. Fickling, who have all helped in the evolution of the apparatus; and Mr. Paul Toller for taking the photographs.

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[1] Mowlem, R., Buxton, J. L D., MacGregor, A. B., Barron, J. N. *Lancet*, 1941, ii, 391.

[2] MacGregor, A. B., Fickling, B. W. *Ibid*, 1943, ii, 290.

SEROLOGICAL TYPING OF MENINGEAL STRAINS OF *H. INFLUENZÆ*

EDITH A. STRAKER, M B LOND., D P H
GROUP LABORATORY, ST. MARY ABBOTS HOSPITAL, LONDON COUNTY COUNCIL

Pittman (1931) studied 97 strains of *Hæmophilus influenzæ* (Pfeiffer's bacillus) derived from pathological sources, and found that 15 strains (7 of which had been isolated from the cerebrospinal fluid in cases of influenzal meningitis) gave colonies on Levinthal agar plates which were larger and more opaque than the typical colony of *H. influenzæ*. The colonies were iridescent when viewed by oblique light, smooth, mucoid, and had a continuous edge and a tendency to coalesce. The organisms were very short rods, uniform in size. On subculture, especially in broth, they tended to become pleomorphic. Capsules could be demonstrated. Sooner or later on subculture these "smooth" strains gave smaller translucent colonies which resembled the typical colony of *H. influenzæ*, the bacilli showing a variable amount of pleomorphism and no capsules. Pittman regarded these as "rough" variants. She found that she could separate the smooth strains into types by means of agglutinating and precipitating sera, the capsule having antigenic properties. At first only 2 types were described, *a* and *b*. All 7 meningitis strains belonged to type *b*. There are now 6 types, *a* to *f*. Most of the American strains from influenzal meningitis belong to type *b*.

On Fildes agar plates the smooth strains give the characteristic colonies described by Pittman. With experience they can also be detected on heated blood-agar plates, and on blood-agar plates on which a staphylococcus has been streaked to produce the "V factor" necessary for full growth of the colony. The appearance of the colony, as Pittman noted, is altered after 18 hours' incubation, the smooth colony becoming as translucent as the rough.

DISTRIBUTION OF SMOOTH STRAINS

Smooth strains of *H. influenzæ* may be found in the nasopharynx and nose of healthy people, and appear to be more common in children. Over a period of four years, 1933–37, I examined the nasopharyngeal flora of boys aged between 14 and 18 years at a public school with a population of about 200. The whole school was swabbed once each term. At every swabbing at least one carrier of smooth strains was found. The maximum carrier-rate at any one swabbing was 19%. Some of the strains belonged to type *b*. In the autumn of 1935 I took nasal and nasopharyngeal swabs from 50 children, aged between 2 and 11 years, at an orphan home. The nasopharyngeal carrier-rate of smooth strains was 8%, and the nasal carrier-rate 10%. A population of 60 adults working in one large building and regularly swabbed at two monthly intervals between 1933 and 1937 only showed an occasional carrier of smooth *H. influenzæ*. The organisms were found only in the throat, never in the nose. No type *b* strains were found.

also be isolated from patho-
the cerebrospinal fluid in cases
meningitis. In 1942 I obtained from the discharging eyes of a baby aged 3 months a *Pneumococcus* type 10, and a smooth strain of *H. influenzæ* type *c*.

In 1941 a smooth strain of *H. influenzæ* from a case of influenzal meningitis in a baby was sent for typing (Jones and Sudds 1942); this was the first cerebrospinal strain I had seen and it belonged to type *b*. Since 1942 I have typed 23 strains of smooth *H. influenzæ*; 21 belonged to type *b*, one to type *f*, and one I could not type, probably because at the time it was sent to me I had prepared sera
nd *f*. Most
of the patients were
nths to 1½
years, but one was a
man of 23,
from whom the organism was grown from cerebrospinal fluid and blood-culture.

Fifteen of the strains came from London County Council hospitals (13 type *b*, 1 type *f*, 1 untyped), 1 was sent by Dr. May of the London Hospital, 2 by Dr. Kidd of Reading, 2 by Dr. R. T. Hutchinson of the Buckston Browne Farm, Downe, Kent, 1 by Dr. Sudds of Aberystwyth, 1 by Dr Montgomerie of the Paddington Green Children's Hospital, and 1 by Dr. Allison of Cardiff. Eight strains were received in 1942, 3 in 1943, and 5 in 1944. All these were fairly evenly spread out over the year. In 1945 7 strains have been received between the end of January and the middle of May.

Of 5 cases of influenzal meningitis in children reported by Gordon, Woodcock, and Zinnemann (1944) 3 were caused by type *b*; the other 2 strains appeared to be similar to those commonly isolated from normal throats.

SENSITIVITY TO PENICILLIN

Dr. May observed that hi
tivity to penicillin, and Dr.
same observation about one o
on a Fildes agar plate, on
placed a disc of sterile filter p
moistened with a

less sensitive to penicillin than the smooth strains and show only a very small circle of growth inhibition.

REFERENCES

Gordon, J., Woodcock, H. E. de C., Zinnemann, K. (1944) *Brit. med. J.* i, 779.
Jones, A. C., Sudds, M. V. N. (1942) *Ibid*, i, 327.
Pittman, M. (1931) *J. exp. Med.* 53, 471.

ERYTHEMA NODOSUM

A SEVERE TYPE IN MIDDLE-AGED WOMEN

E. FRANKEL, M D LOND., M R C P
PHYSICIAN TO ESSEX COUNTY HOSPITAL, WANSTEAD

IT is now generally accepted that erythema nodosum is a non-specific inflammatory reaction of the skin to a variety of agents, including the tubercle bacillus and the streptococcus, and not a specific disease. Biopsy specimens of the affected skin have shown the same type of cellular and tissue reactions in the excised lesions of erythema nodosum as after the intradermal injection of tuberculin and streptococcal nucleoprotein in sensitised subjects.

The 10 cases of erythema nodosum observed by me during the last two years and reported here differed in many respects from the textbook description of this condition. My patients were usually of middle age, whereas most cases of erythema nodosum occur between the ages of 10 and 30. The illness was, as a rule, much more severe than is seen in erythema nodosum. The fever lasted longer and toxæmic disturbances were more pronounced. Involvement of the joints was more conspicuous and the rash on the extensor surfaces of the legs was always very extensive and quite characteristic. Recurrent attacks were frequent, there was no association with tuberculous infection, and the patients presented clear-cut clinical features, a typical course, and a good prognosis.

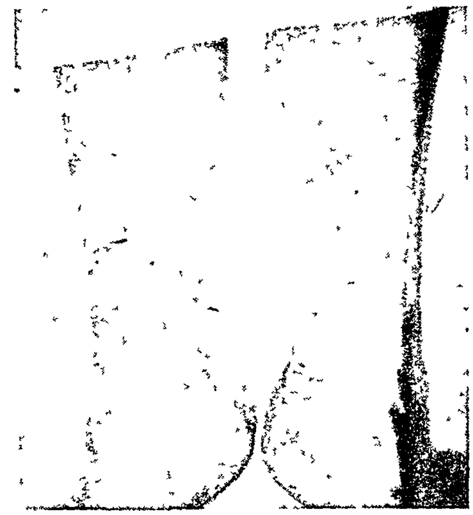
CLINICAL FEATURES

These 10 cases were all in women between the ages of 25 and 70, and 11 were over 30 years of age; 11 were admitted to hospital between the months of November and April. None of them gave a family or past history of tuberculosis or rheumatism. In all of them the illness began rather suddenly about a fortnight before admission. They became feverish, with general malaise, headache, and backache, and perspired profusely; 10 had a sore throat at the onset of the illness. After 3–5 days they began to complain of swelling of various joints and of pain on moving them. The rash appeared on the 8th to 14th day of the illness, and after its appearance the patients were usually admitted to hospital with a diagnosis of septicæmia, acute rheumatism, arthritis, or erythema nodosum. They all looked ill and toxic, perspiring profusely, with tachycardia and swollen and painful joints. Some of them still had a sore throat. They all had pyrexia, and their temperature on admission varied between 99 and 103° F.

The typical rash was seen in all cases and consisted of dark red, raised, round or oval, very tender, warm areas, with an indefinite margin, distributed over the extensor surfaces of both legs and also seen, though less often, on the extensor surfaces of the arms and on the body; they did not fade on pressure. The spots were usually about an inch in diameter, but they often became confluent just above the ankles to form large, irregular, deep red areas 2–4 inches in diameter (see figure). There was oedema of the tissues surrounding the spots.

All the patients continued to be ill; 16 had a remittent pyrexia between 102° and 99° F for one to three weeks, and 3 cases for six to eight weeks after admission to hospital. The heart-rate corresponded to the temperature. The clinical course varied a great deal, 8 patients making a complete recovery after three weeks, 7 taking up to eight weeks to regain their health, and the remainder taking between two and four months; 3 patients were desperately ill. Six women had recurrent attacks and developed a new crop of erythematous areas at varying intervals after the first attack, the recurrence being accompanied by pyrexia and well-marked constitutional disturbances. Every patient, however, in the end made a complete recovery, and none of them developed tuberculous disease while under observation as outpatients.

The white-cell count on admission varied between 6000 and 16,000 per c.mm. There was usually a slight leucocytosis with a normal differential count. Throat swabs were taken in all patients and from 9 hæmolytic streptococci were grown. Radiograms of the lungs did not show any evidence of intrapulmonary disease, and in none of them was the heart affected. Blood cultures were all sterile, and meningococcal fixation tests and Wassermann reactions were negative. The blood-sedimentation rates were raised and varied from 35 to 120 mm. per hour (Westergren). Urine examinations did not show any abnormality.



Rash on legs in a woman aged 66.

Of 9 patients who had streptococcal agglutination tests performed, 7 showed a high agglutination titre, varying from 1 in 5120 to 1 in 160 (normal up to 1 in 80). This increase must be significant, particularly as towards the end of the illness the titre came down to a normal level.

The acute febrile illness with constitutional changes induced me to try sulphonamides and salicylates in large doses, but they had no effect on the course of the disease or the pyrexia. In view of the age of the patients, a Mantoux test was not thought to be of great help. It was done in 5 patients but did not show any significant reaction, being negative in 2 and faintly positive (1 : 1000) in the other 3.

COMMENT

The clinical picture described seems to be common and should be recognised as a clinical entity. It appears to affect only women, usually of middle age, during the colder months of the year. The rash and the course of the disease are so typical that knowledge of it will help in diagnosis and prognosis. None of these patients showed evidence of tuberculous disease, and, in view of the infection of the throat with hæmolytic streptococci and the high streptococcal agglutination titre in a number of the patients, sensitisation of the skin by streptococcal toxin is the likely cause of the inflammatory reaction. The severe constitutional disturbance preceding and accompanying the skin reaction must be due to toxæmia, probably also of streptococcal origin.

SUMMARY

The 19 cases of toxic erythema reported differed from the usual erythema nodosum in affecting only women, mostly of middle age, and in the severe constitutional disturbances. The cause is thought to be sensitisation of the tissues by a streptococcal toxin.

I wish to thank Dr. D. H. Irwin for permission to report 4 of the cases under his care.

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Perry, C. B. (1944) *Brit. med. J.* ii, 843.

Medical Societies

BRITISH ORTHOPÆDIC ASSOCIATION

THE spring meeting of the association was held at Horton Hospital, Epsom, and Hill End Hospital, St. Albans, on June 1 and 2, under the presidency of Mr. ST. J. D. BUXTON.

BONE AND SOFT-TISSUE DEFECTS IN THE LIMBS

Wing-Commander I. LAWSON DICK, RAF, in preliminary observations on *Cancellous Bone Transplants* surveyed the knowledge of osteogenesis in relation to bone-grafting from the time of John Belchier in 1736. The generally accepted view now was that the viability and osteogenetic properties of transplanted bone depended on the facility with which it could be revascularised. Osteogenesis was long delayed in the depths of massive cortical grafts and most readily attained in cancellous bone. If the mechanical stability of cortical grafts could be obtained by other means, healing and consolidation would be hastened by the superior osteogenic properties of cancellous bone. A disadvantage of removing grafts from the tibia was the not uncommon occurrence of fractures in the donor bone. The most rapid and sure method of bone transplantation had been with cancellous chips from the ilium.

Mr. S. L. HIGGS dealt further with the use of *Cancellous Chips in Bone-graft Surgery,* following on the work of Mowlem on plastic reconstruction of the jaw. He reviewed 71 cases of bone-grafting. Of these, 60 were for non-union of the long bones, cortical grafts being used alone in 20 of them and cortical plus cancellous in the other 40. All had resulted in bony union, but with cortical chips alone union had taken at least twice as long as where both types of graft were employed, except in the femur, where the average had been half as long again for healing with cortical grafts alone. If cancellous chips were to do their work well and quickly, rigid fixation must be applied. It was to maintain this, with length and alignment, that cortical grafts were combined with the chips. There need be no hesitation in excising all sclerosed bone from the site of non-union; similarly all fibrous tissue should be excised to facilitate vascularisation. Where skin defects were present as well, these should be adequately treated by plastic methods beforehand.

Mr. IVOR ROBERTSON described the treatment of *Chronic Infective Osteitis,* the essentials of which must be a careful but extensive excision of all infected bone and scar tissue, and the replacement of tissue loss by bone, muscle flaps, and full-thickness skin-grafts. Such treatment required careful selection of cases; those described had been cases of chronic hæmatogenous osteitis of limited area and surgically accessible, and chronic osteitis resulting from compound fractures or war wounds. The treatment was carried out in three stages under penicillin control, and comprised, first, the excision of the bone and soft-tissue defects and the covering of them with Thiersch grafts; secondly, a month later, the removal of this graft and the substitution of a full-thickness skin-graft; thirdly, at least two months later, bone-grafting. Where a non-united fracture was present this required both cortical and cancellous chip grafts. In cases of chronic hæmatogenous osteitis, stages 2 and 3 might be combined, and iliac cancellous chips alone were packed into the dead space between the walls of the cavity and skin flap. To ensure an adequate blood-supply, a muscle flap was swung over them and sutured to the periosteum.

Mr. RAINSFORD MOWLEM, speaking on *Soft-tissue Defects in the Limbs,* emphasised the need in the treatment of injuries for continuous care of all tissues damaged—skeletal, vascular, and neuromuscular—as well as the skin covering. No one element must be ignored, but a limb otherwise sound was useless without its skin covering. Superficial fibrosis secondary to infection and exposure, and the influence of this on underlying muscles and joints, would prevent adequate treatment for these deeper parts and greatly increase the disorganisation of the limb as a whole. Split grafts could be applied whenever there was a good vascular surface and as a rule should be applied as soon as possible. To make them adhere, continuous pressure was preferable to any glue. If the bed was avascular it must be excised. If infection

was present this was no
provided it was dealt with
Ps. pyocyanea, B. proteus,
special problem, but even here successful grafting was not impossible. Exudation was the difficulty, but its mechanical effects could be minimised by using strip or postage-stamp grafts. After a month all grafts tended to become dry and to contract; massage with grease would help to overcome this. Below the knee, grafted areas required long-continued pressure bandaging to reduce the ill effects of
surfaces, keratosis could
sulph-hydryl radicle, but
be only a preliminary to

PENICILLIN

In outlining his views on the *Future of Penicillin Treatment*, Prof. L. P. GARROD began by contrasting penicillin therapy for bone and for soft-tissue lesions: in the latter results could almost be guaranteed, but the

of infection. Improved methods of parenteral administration had brought greater comfort to the patient and greater convenience to the staff. United States workers were trying to overcome the difficulties arising from the rapid elimination of penicillin by developing suspensions in oil and so forth which were more slowly absorbed. It was hoped that improved manufacturing methods would eventually make oral administration generally practicable. The need for strict economy in penicillin had compelled British users to exploit local administration, and there was much to be said for this route, by which an adequate concentration could be
eeded. The effectiveness of
other antiseptics—did not
The full action of the drug
was obtained in low strength: one gained nothing by
icillin the effec-
increased. The
onamides was still
own work, though
lphonamides inter-
apidly multiplying
organisms.

AMPUTATIONS

Prof. G. F. KALMYKOV (USSR), discussing *End-bearing Amputation Stumps in the Lower Extremity*, said that reconstructive surgery in the post-war era would largely be concerned with re-amputation, in view of the practice of carrying out emergency primary amputation behind the battlefield and leaving definitive amputation to a later date. In Soviet Russia the percentage of re-amputations required was not less than 80%. In one large centre in the USA the percentage was 78%. In British hospitals the percentage did not exceed 25%, which was explained by the more frequent use of flap amputation instead of the guillotine. Soviet surgeons where possible sought to create end-bearing stumps by means of an osteoplastic operation, thus following the work of Pirogoff, whose well-known operation on the lower leg was being done in Russia today. Other methods practised in Russia were those of Bier in below-knee amputations and Gritti-Stokes above the knee. After such operations it was important to prepare the stump properly for end-bearing. An end-bearing stump ensured better distribution of weight within the prosthesis and therefore improved gait and confidence. Professor Kalmykov recognised British conservatism in this matter of end-bearing stumps but made a plea for further work in this sphere.

Prof. M. N. POLONSKY (USSR) described a *New Type of Prosthesis* in amputations through or near the hip-joint which he thought solved the well-known difficulties of limb fitting in this region. Its advantages were its lightness, comfort in walking and sitting, and economy in manufacturing costs and time. A normal type of above-knee prosthesis was employed, fixed to the usual type of pelvic band, from the front of which a broad leather sling passed continuously downwards into the front of the prosthesis, over a transversely placed wooden roller, and out through the back of the limb to be attached to the back of the pelvic band where its tension could be adjusted by lacing. The top of the appliance held a slightly hollowed springy platform with soft felt lining on which the soft parts of the hip gained a shock-absorbing support in walking.

INTERVERTEBRAL DISC LESIONS

Dr. E. J. CRISP read a paper on the *Early Diagnosis and Treatment* of intervertebral disc lesions. The lumbar discs suffered trauma more often than was generally appreciated, and in the absence of crural pain or radiographic changes the resulting lesion was frequently mistaken for sacro-iliac strain or fibrositis. The condition could easily be recognised by the extreme and persistent lumbar spasm, at first associated with an increase in the lumbar concavity; later scoliosis to the side of the lesion and lumbar kyphosis developed with sciatic pain. The lordosis occurred when rupture of the annulus fibrosus was incomplete and kyphosis when it was complete. Persistent lumbar spasm and a "tight" lumbar spine in an otherwise healthy patient

such
as the use of a plaster jacket.

Mr. J. E. O'CONNELL dealt in greater detail with the diagnosis of *Lumbar Intervertebral Disc Protrusions*, based on a study of 240 patients explored, 227 of which had given positive evidence of intraspinal protrusions. By
it was possible to
stretching; the
s affected where it
oral foramen next
39 cases had been
by myelography with 6 negative (15%) explorations. In 201 cases explored without myelography there had been only 7 negative operations (3·5%). While a variety of conditions could occasionally produce a picture similar to that of a lumbar disc protrusion there were only three which did so at all commonly—an intraspinal tumour, a metastatic tumour in the lumbar vertebræ, and spondylolisthesis. Clinical examination would help in the differentiation but accessory methods might be necessary. In operative treatment
adequate excisi With proper
selection the e excellent.
Backache was had been a
few recurrences eg.

VASCULAR INJURIES

Prof. J. PATERSON ROSS discussed *Ischæmic Phenomena following Vascular Injuries* in the lower extremity.
He drew atter f the
sural arteries, to a
specially vuln If
these and all the terminal branches of that artery were blocked the leg was liable to be useless and sympathectomy would not improve it; pain might necessitate amputation. Where the sural arteries had

ural vessels pain was found
not appreciably affected by
up in the popliteal or
femoral artery gave a good leg which could often be im-
the vessels to the calf
The popliteal artery
bone and was liable
to "spontaneous" thrombosis which might be related to less direct trauma and to thrombosis arising from degenerative changes. In none of the cases described did gangrene occur but in cases in which the popliteal or femoral vein had to be tied venous congestion was troublesome and was worse after sympathectomy. In arteriovenous fistula, if the main artery was ligated a
developed, but without
essive venous drainage
periphery precarious. In
one case of external iliac artery ligation in which the arteriovenous fistula had not been recognised, and in two cases of wounds of the femoral artery and two of the popliteal artery, immediate paralysis of the lateral popliteal nerve occurred suggesting an important additional segmental supply from the popliteal artery. These recovered like a regenerating peripheral nerve.

Major D. LLOYD GRIFFITHS, RAMC, remarked on the large number of cases of vascular injury to the larger vessels which he had seen in two years at a variety of centres. He attributed this to the great conservation of limbs (due to chemotherapy) which formerly would have been amputated. In the past, and even now, the ligature of main arteries had been carried out too light-heartedly. A large proportion of them, even at reputedly safe sites, had been followed by vicious effects in the periphery, such as intermittent claudication, incorrigible anæsthesia, and gangrene of the digits. He pleaded for the greater practice of lateral suture of arterial wounds and the avoidance of ligature.

MISCELLANEOUS PAPERS

Mr. JAMES PATRICK discussed the diagnosis and treatment of 17 cases of *Fracture of the Medial Epicondyle* displaced into the elbow-joint. Radiological diagnosis might seem difficult because the patient could not extend the elbow enough to permit of a good anteroposterior view. If the medial epicondyle could be seen in the lateral view through the joint line, it might be regarded on this view alone as being incarcerated in the joint. After reduction of the incarcerated fragment (and in all simple medial epicondyle fractures) the fragment lay above the level of the joint line and so ceased to be visible in the lateral view. Reduction in early cases could easily be done by anæsthetising the patient, gently abducting the forearm on the humerus, and applying faradism to the flexor muscles. Cases missed for more than five or six weeks after injury should be treated conservatively. In such cases the epicondyle eventually developed a bony fusion to the ulna. Anterior transposition of the ulnar nerve was probably unnecessary.

Mr. C. PRICE THOMAS, speaking of *Scoliosis in Relation to Thoracic Disease*, said that this type of scoliosis most commonly followed conditions involving the pleura, such as chronic empyema and imperfectly treated hæmothorax. Pulmonary fibrosis and atelectasis also gave rise to the deformity but only when the mediastinum was fixed. The underlying cause was a concentric pull on the chest wall towards the lung root, or an increase in intrathoracic negative pressure, or both. There was a striking difference in the chest deformity from that found in primary scoliosis; the intercostal spaces were much more contracted, the curvature of the rib angles was increased, and the anterior part of the chest was flattened on the concave side of the scoliosis—the reverse to that found in primary scoliosis. Vertebral rotation did not seem to be so pronounced in thoracic scoliosis. Mr. Thomas illustrated the types of remedial exercises used in prevention of the deformity, in the course of treatment of the causal disease, and in the aftercare of thoracic operations. In some operations, because so much of the spinal stability depends on muscles having rib attachments which are lost, some degree of scoliosis was inevitable, but it could still be mitigated by remedial exercises.

Mr. A. D. LE VAY illustrated the importance of *Costoclavicular Compression of the Brachial Plexus* in the explanation of certain neurological and vascular disturbances in the upper extremity. His patient, suffering from symptoms of the "scalenus syndrome" type (without cervical rib), had been treated a year before by tenotomy of the scalenus anterior, after which the symptoms had been worse. The patient had then been operated on by Mr. Le Vay under local anæsthesia. He had found the subclavian artery and brachial plexus very superficial and bound to the back of the clavicle by dense inflammatory fibrous tissue. The artery was small and transversely grooved as if just released from a clamp. By bracing the shoulders back these structures were firmly squeezed between the clavicle and first rib. A portion of the latter was excised, so that artery and plexus sank back against the pleura. This operation had been quickly followed by practically complete recovery.

Dr. PHILIPPE BAUWENS demonstrated a method of measuring the *Action Potentials of Normal and Denervated Muscles*, using a special amplifier with the cathode-ray oscilloscope connected by terminals embedded in the muscles being tested. By attaching a shunt having a resistance exactly counter-balancing the amplifier, with a microammeter, it was possible to switch over during the test and then from the calibrations of the microammeter obtain quantitative readings which were of great value in addition to the qualitative impressions received from the sounds emitted by the amplifier. Dr. Bauwens also demonstrated another apparatus which, taking advantage of the slower chronaxie of denervated muscles, enabled responses to electrical stimulation to be obtained from these muscles without affecting normal muscle-fibres.

Mr. W. SAYLE CREER showed a cinematograph film dealing with some *Foot Faults Related to Form and Function*, which by means of dissections and models illustrated the anatomy and physiology of the foot, its pathology, and treatment.

A clinical demonstration was given at Horton EMS Hospital by Mr. BUXTON and members of the staff; by Dr. P. H. JAYES of the Plastic Unit, East Grinstead; Dr. E. E. HARRIS of the Heritage Craft Schools; Mr. B. H. BURNS and Mr. R. H. YOUNG of Botleys Park; and Mr. F. C. DURBIN of St. Nicholas Hospital, Pyrford.

Reviews of Books

Psychology for the Returning Serviceman

Prepared by a Committee of the National Research Council, USA. Editors: IRVIN L. CHILD, Yale University; MARJORIE VAN DE WATER, Science Service. (Infantry Journal—Penguin Books. Pp. 243. 25 cents.)

THE returning ex-soldier and his problems are rightly occupying a great deal of public attention just now. This small book is a careful and progressive examination of what those problems are and shows that most of them are psychological. The distinguished members of the committee who have helped in writing the book include not only prominent members of the United States Medical Corps but university teachers, social workers, and members of the directorates responsible for the USA war effort. The book shows that the reasons for the problems of the returning soldier are manifold, but fundamentally are created by a change from one group and environment to another; both the group that is left and the one that is rejoined are charged with emotional potentials that in some ways are conflicting. Here all the problems are admirably expressed in simple language with advice to the soldier on how to solve or at least face them. There is a wise chapter on getting married, and others on getting a job, on citizenship, parenthood, and settling down to normally healthy civilian existence.

Since not all veterans are going to return to civilian life with their former good health, six chapters are devoted to illness—psychiatric illness such as battle nerves, injuries to the nervous system, to sight or hearing, and the peculiar difficulties that result from the loss of limbs. The admirable chapters on psychiatric difficulties can be read by the layman without difficulty or offence. The reader will acquire easily an idea of the remote effects of battle and will learn of the long emotional tension of war and its effects on soldiers and civilians alike. The book tells of the veterans' common disturbances of sleep and of his frequent failure in equability of temper. Like another remarkable American production prepared by the same group of scientists and soldiers—*Psychology for the Fighting Man*—this little book can be warmly recommended to British ex-Service men and their family circle.

The Measurement of Colour

W. D. WRIGHT, D SC, ARCS, technical optics section, Imperial College of Science and Technology. (Hilger. Pp. 223. 30s.)

THIS is a book written by a master of his subject with no bias in favour of any class of reader. It is an exposition of the physical principles and methods underlying the quantitative measurement of colour, and although not a "popular" work is written so that anyone with an elementary general knowledge of science can understand its applications to his own specialty. So far as medicine is concerned it is of interest in relation to colour vision and industrial problems of illumination, and important to all who have to make colorimetric and photometric estimations in biological fluids. The first part of the book explains the properties and composition of light in relation to vision in the light-adapted eye, and the way in which a numerical specification of a colour can be achieved. Colorimetry, spectrophotometry, and colour atlases are discussed, and a chapter on practical applications closes a clear and businesslike account of a branch of physics which has developed greatly during the last few years.

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THE LANCET

LONDON: SATURDAY, JUNE 30, 1945

Death in the First Year

INFANT mortality is generally regarded as one of the most sensitive indices of the health of a community. This conclusion finds strong support in a paper by WOOLF and WATERHOUSE,[1] who have studied the influence of social conditions on infant mortality in county boroughs of England and Wales. The main facts and conclusions can be summarised quite briefly. Infant mortality in England and Wales as a whole remained fairly steady at a level of about 150 per 1000 births from 1850 to 1900, but after 1900 it fell steadily to reach a record low level of 53 per 1000 in 1938, the last year for which full records were available. The causes of the relative steadiness from 1850 to 1900 and of the relatively rapid fall from 1900 onwards are not altogether clear. Three widespread misconceptions as to the meaning of the figures can however be eliminated. First, the view that the fall in total infant mortality can be attributed to the decline in deaths from infantile diarrhœa is unfounded. Secondly, there is no scientific support for the view that infant mortality depends on genetic constitution and that attempts to reduce it are an interference with natural selection. Thirdly, the figures do not justify complacency. The steady decline in total infant mortality since 1900 is of course a good thing, but it was still true that in 1938 the rate in the "lowest" social grade was more than twice the rate in the "highest" grade.

In an endeavour to see how this discrepancy between social classes can be correlated with the different conditions in which these classes live, WOOLF and WATERHOUSE devised and examined statistically five social indices which could be correlated with infant mortality during the 11 years 1928–38 in county boroughs comprising about a third of the population of England and Wales. The social indices chosen were the percentage of families with more than one person per room, the percentage of men unemployed, the percentage of occupied males in the Registrar-General's social classes IV and V (the "lowest" classes), the percentage of women employed on manufacturing processes, and latitude. Infant mortality in general increased steadily from south to north, except in social class I (the highest in the Registrar-General's scale). The effect of latitude is therefore probably not the result of climate but of miscellaneous social indices which cannot be accurately assessed. The other social indices chosen showed a high correlation with infant mortality. From a statistical analysis of the available facts the investigators divide the population into different strata with characteristic average infant-mortality rates. For example, for the "better off" (with all social indices negative) the rate is 23·1, for the overcrowded poor it is 108, and for the unemployed overcrowded poor it is 153. There is an additional mortality rise of at least 35 per 1000 in babies whose mothers work in industry.

From these facts WOOLF and WATERHOUSE deduce that if all their poverty indices were removed an infant mortality of about 23 per 1000 could be attained for the country as a whole.

> "In county boroughs
> would be avoided by
> defined by our indices.
> third are associated with overcrowding, one quarter with low-paid occupations, one fifth with unemployment, and one eighth with industrial employment of women. In England and Wales, over 250,000 deaths in 11 years; about 63% of the total, can be attributed to adverse social conditions."

But here perhaps a criticism may be made. To show by statistical methods a significant correlation between infant mortality and certain selected social indices of poverty is one thing: it does not necessarily follow that elimination of the conditions defined by those indices would result in abolition of a given proportion of infant deaths. There are certain unexplained features about the trend of infant mortality; it is possible for example that elimination of poverty indices alone would not have the effect predicted unless it were accompanied by advice on methods of infant feeding and a raised standard of education. The influence of epidemiological factors also is stressed in a recent note by GALE.[2]

This criticism does not affect the main conclusions of WOOLF and WATERHOUSE's paper. These stand or fall on the soundness of the statistical analysis. The authors themselves, being well aware of this, point out that for assessing the significance of their results they have used the strictest and most conservative statistical methods, as was possible because their results are not just of borderline significance. The general validity of their conclusions is further shown by the fact that the rate of 23·1 which would prevail if all poverty indices were eliminated was in fact very nearly reached for social class I as long ago as 1930–32, when it was approximately 30 per 1000. As a challenge to our social conscience, the findings are all the more impressive because the report is free from political or emotional bias.

Indolent Early Tuberculosis

TUBERCULOSIS is said to be a disease without prognosis; and we are finding that this is no less true when the disease is diagnosed in its earliest stages than when it is overt. Nowadays its presence is being revealed "accidentally" by mass radiological surveys many months before any symptoms would have led to a clinical diagnosis, and quite a number of cases thus detected are showing a disappointing lack of response to all forms of treatment.

A preclinically diagnosed patient will usually profess to feeling perfectly well, or—on maturer consideration only slightly "off colour," for which other excellent excuses can be proffered. In addition to the ominous shadow, his erythrocyte-sedimentation rate is somewhat raised, and maybe his mean temperature also. So he is straightway put to bed, where in a few weeks he loses all traces of malaise, gains weight prodigiously, and feels fighting fit. His temperature and ESR return to normal limits and his X-ray appearances are little changed. But from time to time there is a small setback, sometimes unaccountable and sometimes occurring when after months of sameness the patient is allowed to do a little more for himself. He suffers a few hours' malaise, there is a slight irregularity on his temperature chart, a slight rise in his ESR, and on his next film a fresh mottling in some zone hitherto translucent. It is noteworthy that at this stage excavation is rare, or at any rate can rarely be discerned radiologically. Sooner or later an artificial pneumothorax may be induced with encouraging immediate results, which however do not last, because a faint lesion appears in the opposite lung and causes another mild constitutional upset. Even with bilateral APs. the patient still seems to hang fire. Eventually in desperation he may be allowed to get up and start walking exercise. Paradoxically he improves in all respects for a few weeks, and then succumbs to another setback. This time it may be a small pool of fluid in one or other pleural space, which neither waxes nor wanes, and suggests a very indolent "cold" pleurisy. This unsatisfactory lack of definite progress may persist for as long as two or three years, making all concerned with the case wish to Heaven it would Do Something. And then something does happen. A change of the patient's milieu will sometimes bring about a radical change in the tempo and quality of his disease reactions. In the old days a patient at this juncture might be transferred from Britain to the High Alps—or vice versa—and his new medical attendants would reap the kudos of having pulled him round the corner. More usually the change takes place mysteriously within the patient himself. Up to now he has been neither ill nor well, but increasingly disheartened. He now becomes really ill with full panoply of pyrexia, toxæmia, and abrupt loss of weight. On investigation he is found to have developed some dramatic extension of his disease: perhaps excavation, perhaps a fulminating pleural effusion. Thereafter his clinical course is much more definite for better or for worse, and his response to treatment is more decisive. Moreover he is less disheartened.

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[1] Woolf, B., Waterhouse, J. *J. Hyg., Camb.* 1945, 44, 67.

[2] Gale, A. H. *Mon. Bull. Min. Hlth*, 1945, 4, 97.

Investigation and comparison of experience in these indolent cases is called for. There are several lines of inquiry to be pursued. First, it will be generally agreed that this is not a new phenomenon. Reference to archives shows the occasional case in the past which was accidentally diagnosed in the preclinical stage and which failed to fulfil expectations of early resolution and dragged on and on. In the welter of more chronic cases these disappointing therapeutic failures were apt to slip from the memory. In this country war conditions do not seem to have appreciably altered the character of the disease, although the incidence of overt tuberculosis may be higher. These indolent early cases are obviously following much the same course they would be pursuing had they remained undetected. Some of them would never have come to light and would subsequently have shown calcified scars of old battles fought unsung. Others—and we have no means yet of knowing what proportion—would have proceeded to frank clinical disease. What then determines whether and when an indolent case will become "energised"? In many so-called self-limiting diseases there is a rhythm in bodily response. Before the use of sulphonamides was customary, a case of lobar pneumonia could be relied on to become steadily worse until the crisis at the end of the week. Even now, when sulphonamides produce the expected clinical improvement within a few hours part of this rhythmical mechanism persists, for the ESR will still rise for the statutory seven days or so and will then commemorate a crisis on its own. If there is a comparable mechanism in pulmonary tuberculosis, the operative factor cannot be mere length of time but some quantitative measure of provocation; the phoney war drags on until a threshold is passed when the body tissues are provoked to rise and engage the invaders in major conflict. Thereafter it is the body-tissues which wage the war. It is they that "flare-up." Looked at in this light, excavation appears to be a desperate attempt at scorched-earth policy, by which the invaders are ringed about with impervious granulation tissue and their habitat cut off from supplies. Bacilli are harmless in a cavity so long as the barriers hold. Cavities per se do not kill. One has only to survey the X-ray films of full-time workers at places like Preston Hall Colony to be reminded that health, happiness, and efficient citizenship are compatible with lungs resembling egg-crates. It is the unchecked Panzer-like infiltration of tissues that kills. A good brisk pleural effusion also often works wonders in rousing the bodily defences and proving the turning-point in laggard cases. When the pleurisy has resolved, the patient's progress is often much more decisive. This may be due partly to the purely mechanical restriction of the ipselateral lung movement owing to the thickened pleura, but disease in the opposite lung will also improve, and it is no rare finding that sputum manifestly coming from the opposite lung ceases to be TB-positive.

Nevertheless the problem remains—Why is the bodily response in these early cases so indolent? Perhaps the answer lies elsewhere. It must not be forgotten that pulmonary tuberculosis appears to be one of the diseases (like rheumatism and peptic ulcer) which can be psychogenically determined. There exists, in fact, a striking resemblance between tuberculosis and the psychoneuroses. The onset in both often appears to follow hard on some severe emotional upset, and the course seems to depend on the successful emotional reorientation of the patient. In both the prognosis is also influenced by any "secondary gain" which the possession of a disabling illness may bring the patient; for the disease process of any patient who becomes well adjusted to invalidism is apt to run a chronic course and resist all attempts at unwelcome or untimely cure. Both tuberculosis and the psychoneuroses run protracted courses, and where the two conditions coexist in the same patient—as they often do—it is surely no flight of fancy to regard them as being the intimately-linked outward expressions, in terms of bodily and mental illness, of a sickness at heart. The whole patient is sick in mind, body, and spirit. It is surely significant that in the early stages of both diseases the symptoms are overlooked or rationalised and ignored by the sufferer. He is "off colour" but he will not admit it until some dramatic symptom—physical or mental—forces itself on his attention. During these early stages the trouble is present, the seeds of conflict are sown, an ordeal lies ahead, but the patient is not ready to fight the matter out. It is he that is indolent.

The Education Act 1944

EDUCATION in one form or another up to 18 years is to be free. Full compulsory education will cover the years 5–16. Education from 2 to 5 years will be optional and dependent on the provision of nursery schools, which education authorities have a duty to establish "wherever there is a need." Education after the secondary stage will be in county colleges, where attendance will be for one day a week for 44 weeks, one continuous 8 weeks, or two continuous 4 weeks. Primary schools will still cover the age period 5–11; secondary schools will cover 11–16 as soon as the school leaving age has been raised. Primary and secondary education is to be given in separate schools. There is to be a big development of secondary schools which will be of three types—grammar school, technical secondary school, and "modern" secondary school. All children will be required to attend one of these. In brief, school provision is to be as follows:

Nursery school	*Primary schools*		*Secondary school*	*County College (Day continuation)*
	Infants	*Juniors*		
2–5	5–8	8–11	11–16 Grammar, Technical, Modern	16–18

Primary and secondary schools established by the authority are to be known as county schools: those stablished otherwise than by the authority will be nown as voluntary schools. Schools which receive o Exchequer or rate aid are called independent chools; those receiving a grant direct from the Exchequer, direct-grant schools. All schools other than independent or direct-grant are *maintained*—i.e., receive assistance either wholly or in part, and in ome form or another, from the local education authority. It is to maintained schools that the provisions as to medical inspection and treatment refer.

This is the bare bones of the "reformed national system of education" outlined in *The Nation's Schools* Pamphlet No. 1, issued by the Ministry of Education. By this means we hope "to secure for children a happier childhood and a better start in life." The four most noteworthy advances are the universal provision of free secondary school education, the county colleges, the elaboration of special schools or special provision in ordinary schools for handicapped children, and lastly the recognition of the value of nursery schools. Secondary education is at present available mainly in grammar schools, which accommodate about half a million boys and girls; technical schools today provide for very few, less than 100.000 children, including war-time expansion; the "modern" secondary school, born from the Hadow reform of all-age schools, is also little more than rudimentary, for the Hadow reform is far from completed. The purpose of the Act is to raise "technical" and "modern" schools to the plane of the grammar school. A universal age of entry at 11+ and a leaving age of 16 will go far towards this. The technical secondary school is to become one of the bulwarks of the nation and in its new form should direct to industry many children who at present have no alternative to entering grammar schools and the black-coated professions. Industry on the production and manufacturing side has been deprived of its reasonable share of the national talent—a loss which a country so highly industrialised as this cannot afford to carry.

When the three types of secondary school are in full operation the number of children at such schools will increase to over three million. How these will be apportioned is not yet clear. The number in grammar schools is unlikely to increase, since 40% of those already attending fail to take a school certificate and many must be misplaced. The technical secondary school will advance, and possibly come to equal the grammar school. The greater number will, however, be taught in the modern secondary, for it must remain true that the majority of the King's subjects will not enter employment demanding "any measure of technical skill or knowledge" apart from home responsibilities. Hence it will be the modern secondary school that will allow a "large number of the country's future citizens to enter the larger world trained in character, adaptable and awake to the possibilities that lie within themselves of finding and pursuing interests both of mind and hand that will aid their further development and add to their pleasure in life." The county colleges will be day continuation schools similar to those which have functioned for 25 years at Rugby and elsewhere. Each week for a day all boys and girls after leaving school will attend a college for further education. This step in itself may equal in importance and even surpass any of the others. Here it will be possible not only to continue a liberal education but also to supervise health and impart at a receptive age those principles of social education now in everyone's [illegible] ..dly in need of elaboration—[illegible] housecraft, housewifery, [illegible] ..ealth education, and the like.

Provision for the handicapped pupils has been considered in great detail, and "special schools," or in some cases special provision in ordinary schools, will be provided for them all. These children who require special educational treatment fall into eleven categories—the blind, partially blind, deaf, partially deaf, delicate, diabetic, educationally subnormal, epileptic, maladjusted, physically handicapped, and those with speech defects. It is the duty of the education authority to ascertain all such children in the area. The blind and epileptic *must* go to boarding-schools; the physically handicapped, deaf, and those whose speech defect is due to aphasia *must* go to a special school, not necessarily a boarding-school; the delicate, diabetic, educationally subnormal, maladjusted, partially blind and partially deaf, and those with speech defects not due to aphasia can be educated in an ordinary school, if special provision can be made for them in the school—if not, they too must be admitted to a special school. The partially blind are, if possible, to receive their education in schools distinct from those for the blind. It is certain that facilities for both ascertainment and treatment will need to be greatly expanded.

THE KING has nominated Dr A. C. Fisher as an unofficial member of the legislative council of Northern Rhodesia Dr Fisher is chief medical officer at The Roan Antelope Copper Mines, Luanshya.

Annotations

TOXICITY OF THIOURACIL

EVIDENCE is accumulating that the early reports on the use of thiourea and its derivatives in thyrotoxicosis gave too optimistic an impression of their toxicity. The list of toxic reactions with thiouracil is now unpleasantly long—agranulocytosis or granulocytopenia; drug fever; various skin lesions, such as dermatitis, urticaria, prurigo; jaundice; œdema of the feet; arthritis or arthralgia; lymphadenopathy, especially of the submaxillary gland; splenomegaly; cardiac arrhythmia; exacerbation of thyrotoxic symptoms; and enlargement of the thyroid gland. One observer[1] has calculated that the incidence of toxic reactions in all the cases so far reported is 10%, that of agranulocytosis being 1%. In a series of 43 cases, Gargill and Lesses[2] encountered toxic reactions in 7 patients (16%), including one fatal case of agranulocytosis; while another American observer,[3] noting that all workers who have used thiouracil have seen instances of toxicity, reports toxic manifestations in 10% of his 30 cases. At the Massachusetts General Hospital[4] toxic reactions have been encountered in 15% of the cases treated with thiouracil. Other potential dangers are suggested by experimental work. Thus the administration of thiourea to pregnant rats results in activation and hyperplasia of the thyroid gland and retarded growth of the offspring.[5] This finding suggests caution in the administration of thiourea or thiouracil to thyrotoxic patients who are pregnant. More serious in its implications is the observation of Bielschowsky,[6] again in rats, that the administration of allyl-thiourea and 2-acetyl-amino-fluorene results in the production of both benign and malignant tumours in the thyroid gland. He had previously found[7] that 2-acetyl-amino-fluorene alone does not produce malignant tumours in the thyroid, though it does in many other parts of the body, so allyl-thiourea seems to make the thyroid susceptible to the action of this carcinogen. The possibility of thiouracil therapy increasing the incidence of malignancy is no doubt being carefully watched in all thyroid clinics.

All this does not mean that thiouracil and its derivatives should be discarded, but that they should be reserved for carefully chosen cases treated under expert supervision in fully equipped institutions, while energetic measures are taken to reduce the toxicity of the drugs. It may well be that methyl thiouracil, as advocated by Leys,[8] will prove to be an improvement on its predecessors, though his series is not yet long enough to exclude luck. Pending the production of such a less toxic preparation, careful consideration should be given to the effectiveness of smaller dosage. Thus Williams and Clute[9] noted 16 toxic reactions in the 152 patients whom they have treated with thiouracil, but only 4 of these were in the last 100 cases treated. This decrease in toxicity is attributed to smaller dosage, the dose now used being 0·5 g. daily for the first two weeks, and then 0·3 g. daily until BMR is normal, when the dose is reduced to 0·1 g. twice daily; after two or three months this is further reduced to 0·1 g. daily. Another promising line is to administer with the thiouracil some preparation which will reduce the incidence of agranulocytosis—the most serious complication. Leys used proteolysed liver in several of his cases, and Goldsmith and his co-workers[10] have used a diet rich in B-complex factors. Cantor and Scott[11] think that the factor in liver responsible for its granulocytopoietic effect is pyridoxine, and one of the three cases of agranulocytic angina which they record as responding to treatment with pyridoxine was due to thiouracil. By one or all of these three approaches the thiourea treatment of thyrotoxicosis will no doubt be made much safer; but, like the other potent remedies the chemists have put in our hands, these drugs can never be administered in the haphazard manner which suited the therapeutics of twenty years ago.

PENICILLIN BY RECTUM

THE search for new methods of giving penicillin goes on apace and even with acceleration. From simple injection into muscle or vein, or continuous intravenous infusion, users have passed to the successful novelty of continuous intramuscular infusion, and thereafter, as penicillin has become more plentiful, to injection methods designed to prolong absorption, to oral administration in a variety of medicinal cocktails, to the suggestion of administration through infected cavities, and now to administration by rectum. All this work has been directed to easing treatment for the patient, but in most cases it has involved expending much greater amounts of penicillin than would be required by injection. The main exception is the method of M. E. Florey and Heatley[12] which is applicable only to a limited class of patients; here 120,000 units given at a single injection into pleural cavities was as effective, judging by the blood levels, as the same dose given by divided or continuous intramuscular injection over 24 hours.

Before it can reach the intestine, where it will be absorbed, penicillin given by mouth or rectum must pass through an area where inactivators of penicillin are to be found, so that the gastro-intestinal route is almost certain to be wasteful. The acid of the stomach can to some extent be counteracted or avoided by chemical or physical means, though even so larger doses are required than by injection.[13] The rectal route, on the other hand, will bring the penicillin into contact with a powerful inactivator to which no antidote is yet available—the enzyme penicillinase, produced by bacteria common in the colon, such as *Bact. coli* and the paracolon bacilli.[14] Nevertheless, Loewe and his colleagues[15] have studied the effects of rectal administration experimentally in fourteen subjects, seven of them being recumbent hospital patients chosen at random, and seven healthy ambulant volunteers. Without preliminary preparation of the bowel, rectal suppositories containing sodium penicillin in cocoa butter were inserted into the rectum, and blood samples were taken hourly for 12 hours and again at 24 hours. The doses were very large—300,000, 500,000, or 1,000,000 units. Absorption was, as might be expected, very irregular as between the different subjects. In two, given 500,000 and 300,000 units, no penicillin could be detected in the blood at any time. In others penicillin was demonstrated for periods ranging from 1 to 12 hours. In two subjects it was found at 24 hours, but had not been present continuously before that. In only one subject was the level higher than 0·012 unit after the seventh hour, and though this level may be adequate, as Loewe and his colleagues say, to inhibit most strains of the gonococcus, pneumococcus, and hæmolytic streptococcus, it is barely inhibitory for a sensitive staphylococcus, such as the "H" test strain.[16]

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[1] Leathart, G. L. *St. Thomas's Hosp. Gaz.* 1945, 43, 58.

[2] Gargill, S. L., Lesses, M. F. *J. Amer. med. Ass.* 1945, 127, 890.

[3] Paschkis, K. E. *Med. Clin. N. Amer.* November, 1944, p. 1362.

[4] Rawson, R. W. *J. Amer. med. Ass.* 1945, 128, 69.

[5] Goldsmith, E. D., Gordon, A. S., Charipper, H. A. *Amer. J. Obstet. Gynec.* 1945, 49, 197.

[6] Bielschowsky, E. *Brit. J. exp. Path.* 1944, 25, 90.

[7] *Ibid*, p. 1.

[8] Leys, D. *Lancet*, April 14, 1945, p. 461.

[9] Williams, R. H., Clute, H. M. *J. Amer. med. Ass.* 1945, 128, 65.

[10] Goldsmith, E. D., Gordon, A. S., Finkelstein, G., Charipper, H. *Ibid*, 1944, 125, 847.

[11] Cantor, M. M., Scott, J. W. *Canad. med. Ass. J.* 1945, 52, 368.

[12] Florey, M. E., Heatley, N. G. *Lancet*, June 16, 1945, p. 748.

[13] Heatley, N. G. *Ibid*, May 12, 1945, p. 590. Burke, F. G., Ross, S., Strauss, C. *J. Amer. med. Ass.* 1945, 128, 83.

[14] Abraham, E. P., Chain, E. *Nature, Lond.* 1940, 146, 837. Harper, G. J. *Lancet*, 1943, ii, 569. Bondi, A., Dietz, C. C. *Proc. Soc. exp. Biol. NY*, 1944, 56, 132.

[15] Loewe, L., Alture-Werber, E., Rosenblatt, P. *J. Amer. med. Ass.* 1945, 128, 83.

[16] Abraham, E. P., Chain, E., Fletcher, C. M., Florey, H. W., Gardner, A. D., Heatley, N. G., Jennings, M. A. *Lancet*, 1941, ii, 177.

No advantage accrued from giving 1,000,000 units as compared with the other doses tried, penicillin being detected in the blood for only 7, 7, and 4 hours in the three subjects who received this enormous dose.

The use of the rectal route is being further investigated. If this method is to become comparable in usefulness even to administration by mouth, with all its uncertainties, it must be improved a great deal. To expend from ten to thirty times the dose required by injection and still be uncertain of obtaining a satisfactory blood level is clearly in the best interests neither of the patient nor of a community still short of penicillin.

A POSSIBLE CURE FOR DDT POISONING

A few months ago[1] we reviewed the experimental evidence on the toxicity of DDT to vertebrates and reached the conclusion that, if this new insecticide is properly used, the danger to man is very remote. Since then an account of

corded[2]; but it does

symptoms developed only after a deliberate exposure to DDT far in excess of anything that would be likely in practice. Nevertheless, if DDT is to be as widely used in the future as we expect, it is not impossible that habitual carelessness on the part of an operator applying the insecticide in solution may result in intoxication. It is therefore useful to know of a remedy. Brazilian experiments[3] suggest that calcium salts may be effective for treatment. The authors observed that the symptoms following administration of DDT are not unlike those of carbon tetrachloride poisoning. Since calcium had proved effective in preventing the effects of acute intoxication by carbon tetrachloride, it was tried for DDT. Dogs were given DDT (100 mg. per kg. bodyweight) in olive oil daily until intense symptoms of poisoning were observed. It was found that intravenous injection of 20 c.cm. of 10% calcium gluconate effected recovery in 2–3 hours instead of the 12–24 hours necessary in the absence of treatment. Furthermore injections of calcium gluconate for several days *before* DDT administration much reduced the severity of the intoxication. The dogs used in the experiments were alive and well a month after the end of the experiments.

HOME AGAIN

LAST week saw the beginning of the process by which 750,000 Service men and women will be returned to civilian life, mainly from the Army, by the end of the year. Every day now uniformed men and women are passing into the various demobilisation centres throughout the country at the rate of one or so a minute; there they receive their railway warrants, health insurance cards, and the like, are fitted with civilian clothes worth £15 and 63 coupons, and can buy enough tobacco to last themselves eight weeks, and enough sweets to last their family ten minutes (two weeks' ration). There can be few homes where the returning ex-Service man is not given a warm and genuine welcome, but the homecoming will rarely be completely free from strain, disappointment, and regrets, especially perhaps among the older age-groups being released first. The veteran left his home as a civilian perhaps six years ago. His introduction into the Army or one of the other Services proved difficult and for some men even painful. But he learnt his new trade and now returns as a trained soldier with much experience of battle, of living close to death, of grief and rage at the loss of trusted comrades, perhaps of crippling wounds, or the even worse trial of capture and imprisonment. So it is not easy for him at first to recall the old habits, share the interests, and follow the conversational allusions of even the beloved domestic circle. Though newspapers from home and even the Forces' programme may have reached him regularly, he is unlikely to be well-informed on the commonplace news of home; the local gossip, though faithfully recorded in the weekly letter, will seem to him trivial and obscure; and he may fail to realise the fund of subtlety, patience, and self-sacrifice which

he homecoming meal. He soo

tory, and finding his own small

to others is apt to fall into silence. Many men soon realise that there are regrets in leaving a Service and becoming a civilian, and these regrets tend to be most prominent when the simple comforts of home are again everyday things. Wives and sweethearts, parents, and friends too will experience some difficulty of readjustment; this is not the man that left them, but in many ways a stranger, given perhaps to uncertain, unexpected, and unpredictable conduct, strangely angry at times, perhaps impatient of old ways and old joys, and speaking a different dialect. There can be a clash between the two groups that are now reunited unless mutual understanding and tolerance are there to ease the period of readjustment for both parties, but to be forewarned of the difficulties is to be forearmed against them.

ANTI-HR SERA

SEVERAL different human immune sera found in Rh-positive persons investigated in America have been referred to as "anti-Hr" because they agglutinated the cells of Rh-negative persons as well as those of some Rh-positives. The first of these was referred to by Levine[1] in 1941. No satisfactory description of these sera was forthcoming and indeed the reactions appeared to be very variable, especially if the titres were poor. In 1943 the first of this type of serum found in England was brilliantly elucidated by Race and Taylor,[2] and its action was later correlated with the three other Rh antisera[3 4]; they called this serum by the first two letters of the patient's name, "St." From their work it became clear that the Rh-negative character was not recessive, as had been thought, and was capable also of causing immunisation in an Rh-positive person.

Six genes had been recognised by Wiener and his colleagues[5] and by Race, Taylor, and their colleagues,[4] who had also evidence for the existence of at least one more gene which they called Rh_y. And when Fisher's triple allelomorphic system of Rh antigens was described by Race,[6] eight codominant genes were postulated. This theory demanded the existence of two further antisera, making six in all. Some support for Fisher's theory was obtained by Murray, Race, and Taylor[7] when they demonstrated the inheritance of one of the two hypothetical genes in a remarkable family study. Now the system gains almost entire support by the discovery of both of the two hypothetical antisera required to complete the set of six antibodies. Mourant[8] has found the fifth (η) in a man immunised by repeated transfusion, and Race[9] shows that a serum called anti-Hr by Waller and Levine[10] in America is not similar to St but must be the sixth (δ). The difficulty in recognising these sera in America has no doubt arisen from the fact that three different antisera react with cells containing the Rh-negative character, and they also tend to exhibit a single and double dose effect, especially if the titre is weak, according to the quantity of antigen

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[1] *Lancet*, Feb. 24, p. 248.
[2] Wigglesworth, V. B. *Brit. med. J.* April 14, p. 517.
[3] Vaz, Z., Pereira, R. S., Malheiro, D. M. *Science*, 1945, 101, 434

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[1] Levine, P. Yearbook of Pathology and Immunology, London and Chicago, 1941, p. 509.
[2] Race, R., Taylor, G. L. *Nature, Lond.* 1943, 152, 300.
[3] Race, R., Taylor, G. L., Boorman, K., Dodd, B. *Ibid*, p. 563.
[4] Race, R., Taylor, G. L., Cappell, D. F., McFarlane, M. *Ibid*, 1944, 153, 52.
[5] Wiener, A. S., Sonn, E. B., Belkin, R. B. *J. exp. Med.* 1944, 97, 235.
[6] Race, R. *Nature, Lond.* 1944, 153, 771.
[7] Murray, J., Race, R., Taylor, G. L. *Ibid*, 1945, 155, 112.
[8] Mourant, A. E. *Ibid*, p. 542.
[9] Race, R. *Ibid*, p. 542.
[10] Waller, R. K., Levine, P. *Science*, 1944, 100, 453.

present in the cells tested. Unfortunately Wiener[11] has confused the issue by stating emphatically that all anti-Hr sera are identical with St of Race and by failing to accept the triple allelomorphic theory.

The table, modified from Race,[9] shows how Waller and Levine's observed reactions with anti-Hr fit with the predicted reactions of Fisher's δ, called "serum 6" by Murray.[12] The figures, 456·456 &c., indicate the antigenic constitution of the genotypes.

Antisera		"Rh-negatives"	$Rh_1 Rh_2$	"Rh_1 blood of white individuals"	
				60% $Rh_1 rh$	40% $Rh_1 Rh_1$
Murray	Fisher	456·456	135·234	135·456	135·135
1	Γ	−	+	+	+
2	H	−	+	−	−
3	Δ	−	+	+	+
4	γ	+	+	+	−
5	η	+	+	+	+
6	δ	+	−	+	−
Levine's anti-Hr		+	−	+	−

The situation now is that there are six Rh antigens for each of which there is a specific antiserum, and these six antigens are inherited according to strict Mendelian principles by means of eight genes. Each gene confers a selection of three antigens, all detectable by the appropriate sera. Thus a person's cells may contain three, four, five, or six Rh antigens, and there are 27 serologically distinguishable Rh types of blood. Moreover Fisher[13] has pointed out that it is only among the rarer of the 36 genotypes that recognition will have to rely on pedigree evidence. To complete the entire picture it remains to find the last Rh gene segregated as Rh_z in the family studied by Murray, Race, and Taylor.[7]

HOW MANY NURSES?

THE King Edward's Hospital Fund for London has followed its valuable memoranda on hospital diet and the supervision of nurses' health with another on standards of staffing in hospitals.[14] The new pamphlet is as important as the others, for on the ratio of nursing staff to patients, and of trained nurses to student nurses, depends not only the efficiency of the nursing care of patients but also the training of the student nurses. Some might think this memorandum has appeared at an inopportune moment, when nurses and students are scarce; but if the scarcity is the result of the conditions under which nurses live and train, this is the time to review the position and consider suggestions for improvements. The Fund's subcommittee on nursing staff, with Dr. Morley Fletcher in the chair and with Miss H. Dey and Miss E. E. P. MacManus as coöpted members, realise that parents oppose nursing as a career for their daughters mainly because it is such a hard life, and think that its hardness largely arises from understaffing. Quoting from a recent leading article, they write, "Present standards of hospital staffing, which work everybody to capacity all the time, and meet extra claims by achieving the impossible, need revising before a nurse can report sick without uneasiness."

The factors to be taken into account in assessing staffing requirements include considerations of space, the relative size of the domestic staff, and the reserve or "pool" of nurses available. In regard to training schools, the subcommittee emphasise the importance of the ratio of trained nurses to student nurses, and propose a ratio of 1 trained to 2·5 student nurses. They urge the need for an adequate trained staff and condemn the expedient of increasing the establishment with student nurses only. A properly balanced training for nurses is essential, and they give an example of the unfairness to the student nurse with previous nursing experience of using her in the special work in which she has previously trained; a State-registered sick children's nurse was used for a period of ten months in the children's wards [illegible] training. This point seems to have [illegible] or in some cases the entire hospital system might break down without the complement of previously trained or experienced nurses who enter a general hospital for training and are capable of rising to an emergency and so cloaking the existing gaps in the trained nurses employed.

In considering the ratio of ward nursing staff to inpatients the subcommittee chose 6 general hospital training schools of sizes varying from 112 to over 700 beds. The nursing staff per 100 beds varied from 38·5 to 53·5 nurses. The hours of work at 5 of the hospitals under present arrangements were between 95 and 132 per fortnight. If the 96-hour fortnight was introduced the number of nurses would have to be increased by about 12 per 100 beds, to 45·5–65·5.

The highest figure—65·5—the committee did not consider adequate to make full provision for the needs of the patients and give the student nurses some student status, and they suggest a ratio of 70 ward nursing staff per 100 inpatient beds to be made up as follows:

Sisters	5
Trained staff nurses	5
4th year student nurses	10
1st to 3rd year student nurses	50

The subcommittee further propose that, in a hospital where a three years' training obtains, an additional 10 State-registered staff nurses will be required, in lieu of the 10 fourth year nurses. This suggests that the nurse under a four-year contract carries the same responsibility for work as a qualified staff nurse. This supposition is borne out also in the ratio of trained nurses to student nurses. The figures given are, "one trained to 2·5 student nurses (if fourth year student nurses are reckoned for this purpose as trained nurses)." The subcommittee foresee that within the next few years many more hospitals will adopt the block system of training, and for this purpose they recommend an increase of a fifth in first to third year nurses—that is, an additional 10 student nurses per 100 beds. It would be useful to know how many hospitals have already adopted the block system. The long span of the nurses' working day is considered unsatisfactory. In two instances the subcommittee mention the need of exploring the 8-hour shift system or making some modification of it—a reform long overdue.

CARE OF TUBERCULOUS EX-SERVICE MEN AND WOMEN.—The Scottish branch of the British Red Cross Society is to make the welfare of the tuberculous ex-Serviceman, including members of the Mercantile Marine, its special care, and as a first step in this work has bought Tor-na-Dee Sanatorium in Aberdeenshire and the former Nordrach-on-Dee Sanatorium (now known as Glen O'Dee) in Kincardineshire. Tor-na-Dee is already acting as a Red Cross sanatorium and is being used for the treatment of men and women officers and members of the nursing services. The Glen O'Dee building, which has been occupied by troops during the war, has now been derequisitioned and the repairs and alterations are being carried out as quickly as possible to provide a modern sanatorium unit of 100 beds for the treatment of men and women of other ranks. It is hoped to increase this to 200 beds soon.

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[11] Wiener, A. S., Davidsohn, I., Potter, E. *J. exp. Med.* 1945, 81, 1, 63.

[12] Murray, J. *Nature, Lond.* 1944, 154, 701.

[13] Fisher, R. A. *Ibid*, 1945, 155, 543.

[14] Nursing Staff: Considerations on Standards of Staffing. Pp. 26. 6d. post free from Geo. Barber & Son Ltd., Furnival Street, EC4.

Special Articles

DIRECTED TEAM-WORK IN RESEARCH

PART OF THE SURGEON'S EDUCATION

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If some changes are necessary to improve the surgeon's education, can we not think in wider terms than that of the mere surgeon? Can we not think of something that while improving the education of the surgeon will also benefit medicine as a whole? At a meeting of the Association of Surgeons in Liverpool some ten years ago Lord Moynihan said that although up to then the anatomy rooms had been the recognised portal to a surgical career, times had changed. He emphasised that though anatomy was a fundamental of the surgeon's equipment, the long hours spent in the teaching of elementary anatomy were a waste of time, and that experimental surgery and the laboratory should be the only recognised method of advanced surgical training. A little later Sir David Wilkie gave a lecture to the Harveian Society in which his theme was a plea for the young surgeon to return to the methods of Harvey—in other words, to spend a certain time in the laboratory. Suppose we were to follow the advice of these two great surgical teachers—*instead of merely agreeing with them*—what would happen?

This country is about to be split up into about 17 medical areas. Suppose we took 10 of these areas, each with a university, and instituted laboratories which would take, say, 50 research workers. Suppose each research worker worked there for a minimum of six months, with if necessary a month over when it is necessary to hand over an unfinished experiment to a successor. Each of these centres would have a director, with a staff of assistants who would also be working there but helping and guiding the workers, especially at the commencement of their investigations. A chief director would be in charge of all centres.

In these centres the method of research would be quite different from what has hitherto prevailed in this country. The director would decide on the problem to be studied. This would be split up into, say, 50 inquiries to be made. (It must be remembered that a negative answer is just as important as a positive one in science. But only those which looked likely to give positive results have been tackled by any except the researcher who has made a career of it. Hence our want of progress.) Suppose in the year's work 47 of those inquiries prove negative and 3 positive. Then the positive ones would be pursued till either success is gained or a dead end is come to. But that part of the problem is finished for ever; another is then taken up and dealt with.

Now every 12 months in each centre 50 years of directed surgical research is concentrated. If all the centres are directed to one object then there is 500 years of directed research every year. In 21 years there is 10,500 years' directed research. Does anyone suppose that there is any problem in medicine or surgery which is capable of solution by the human brain which would not be solved long before 21 years? How does this compare with the solitary investigator pursuing his own lone furrow? In 50 years he might be as far as one centre in one year.

I have taken 21 years for a special reason, for our greatest research effort conducted by our present happy-go-lucky methods is the British Empire Cancer Cam-

the object aimed at; there is no strategy, no tactics, no concentration on any particular object, no communication between the various branches of people who are supposed to be in action. There is in fact no semblance of a campaign—it is not even guerilla warfare. Guerilla warfare at least is sustained either by patriotic fervour or has political backing. The BECC has neither. It finances and equips a few riflemen with a limited amount of ammunition in different parts of the kingdom; in *certain university centres it supports that smallest of* military units, a platoon. That is all. There is no common object, no communication with each other. It is a go-as-you-please system. It has existed for 21 years, spent a million pounds, and what has it got in practical value for the treatment of human carcinoma? Stilbœstrol, certainly, but little else that I know of. This is not an attack on the BECC in any way. It is just an explanation of how it works.

This is our way of conducting original research; it may be the best way, but then again there may be better ways of doing things. The method just suggested might possibly be a better way. Besides giving the surgeon some inkling into statistics, some insight into research and how to conduct it, some introduction really to the scientific side of his profession, and perhaps an additional interest in it, we might be doing something for the benefit of medical science as a whole.

Perhaps a part of the primary examination for the FRCS might be replaced by this course in the laboratory. Perhaps the other Colleges of Surgeons might move in the same direction. A one-portal entry to the profession

e suggested that all those

rees and qualifications in

? Could not the universities accept the course of research in place of the thesis which is now necessary for these degrees? This would *mean that research would be carried out by the best* brains in the profession.

OBJECTIONS

Objectors will say that this scheme is impossible, because everyone is not fitted for research; as if research—the ordinary plodding sort—was not just laying one brick upon another till the edifice is raised. I am not here referring to the world-famed research person, the one man in a million; I am referring to the ordinary man capable of finding out the answer to a simple problem. Go to a U-boat factory and find out how many of the men employed are capable of building a U-boat—none. Yet the result is an intricate engineering feat. That is the ABC of research. Let us hear no more of So-and-so having no knowledge or aptitude for research.

The second thing which will be said is that this is a new idea untried; obviously it will not work; why should anyone

When I was a

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in chemistry. For this he had to write a thesis and I asked what he had chosen for his subject. He told me his professor had not yet given him his piece of work to do. The professor used all his students in this way to amplify the work he was conducting. The more important parts were done by him and his assistants, but the donkey work was done by the men who wanted a degree—the ordinary students not the born research workers. That method was widely used throughout Germany, and it helped to put Germany in the forefront of chemically and physically minded nations. In every branch of chemistry—dyes, synthetic drugs, anything you like—they were in the front line; I do not say they led. Take "606"; the very name tells you how it was found. They had 605 inquiries which were negative before they struck what they were looking for. This was obviously the work of a team; one man would hardly live long enough to do such research. Team-work, directed team-work, is the modern idea.

Then it will be argued that this is a German idea and quite foreign to our methods and point of view, and therefore unsuitable for us to adopt. Are we sure that this method of directed team-work cannot be adopted in this country? Let us see. Sir Alexander Fleming discovered penicillin in 1928. None of us ever heard of it till the war started at least 11 years later. A surgeon who worked at St. Mary's first heard of it when General Ogilvie opened a discussion on the sulphonamides in 1940. The discussion was rather dull until Fleming got up and showed his cultures of penicillin, and stated that it was "ten times more effective than any of the sulphonamides." Sir Howard Florey formed a team and went to work at Oxford. He had 7 workers under him at first; others were attracted later. In the first 12 months he had 7 years' work, by the second he had 14 and probably more, at the end of 2½ years there were institutions like great distilleries turning out the stuff by the vat.

Now will anyone say that this method of concentrated work by teams cannot be worked in this country? How many years would one man have taken to produce the same result—even Fleming or Florey? If anyone still doubts that team-work is the method of the future, let him consider Mulberry, Pluto, and Fido. Could they have been carried out by any other means?

HEURISTIC METHOD IN RESEARCH

M. R. A. Chance, BSC LOND.

> "... Among the minds of researchers he distinguishes the patient plodders, the impatient drivers (brilliant but careless), the versatile yet inconclusive dilettantes, the fanatical cultivators of single fields, and the occasional uprising genius who seems to have the virtues of them all ..."—*The Anatomy of Research.* THE LANCET, April 7, 1945, p. 437.

ENCOURAGED by this quotation from an unpublished review of a yet unwritten study of the mind bent on scientific research, I venture to suggest that the following features of the research worker's activities and heuristic[1] methods would feature prominently in such an important book.

If the anatomy of research includes the social organisation of research then the types characterised in the "preface" would comprise the almost ideal group of men to work under the direction of a competent research administrator, who, able to select his men, could deploy his forces as information coming to hand suggested new lines of advance. This has in fact been achieved to some degree in America and to a greater extent in Germany, where it was mainly exploited by large industrial concerns that before this war made notable contributions to biochemistry, physiology, and chemotherapeutics. During the war the same type of German organisation has been no less successful in technical achievements—especially the propulsion units of the flying bombs—but their contribution to systematic knowledge has still to be revealed. It is doubtful whether the same amount of coordination between the work of individuals in a research team has ever been achieved anywhere else—certainly not in this country, though perhaps a comparable measure of conscious integration is growing up in the Soviet Union.

INTEGRATION OF INITIATIVE

The integration of individual initiative into the organised structure of coöperative endeavour is the problem of the future in all walks of life, but the solution will be difficult to find in scientific research. The integration of research in the large German chemical industry had a practical aim, and, as is made clear below, this is an easier problem to tackle by explicit endeavour than organising research on an international or even a national scale so as to provide channels for the growth of individual initiative.

Such highly integrated units are not characteristic of this country, perhaps because so many directors of research achieve their status without much administrative experience or training (already before the war Prof. L. T. Hogben had set out to remedy this in a course of lectures at the London School of Economics), or perhaps because they have graduated from the team of which they were once a part and find themselves too acutely aware of the desire of their colleagues to be left alone with their problems—a desire experienced by all genuine thinkers at times during their research careers.

On the other hand, a healthy respect for the right of the individual worker to follow his own path is the outstanding feature of the attitude to research in this country. This leaves the individual free to avail himself of the diverse sources of endowment, and leaves the directors of research with the task of administering their endowments for the purpose for which they were established rather than with their minds directed towards the maintenance and development of a single team working towards a specific aim or integrated by the wide vision of a single man. Integration more often takes place at the operative level between the workers engaged on the job—a highly desirable feature. Nevertheless a satisfactory approach to many research problems requires the coöperation of a number of workers in different branches of science and this can only be achieved without waste by a team. Endowments for the individual worker from diverse sources must, therefore, either grow commensurate with the development of his needs, which is ultimately impossible, or must form part of the maintenance of research institutes.

Such developments must occasion the scientific research worker some concern and cannot just be dismissed by reliance on the *status quo ante.* Too much discussion however continues on the planning of research without a clear idea of exactly what the mental characteristics are which make for the success of original research.

The motives for undertaking research have not yet come under social scrutiny, though economic gain and disinterested curiosity are generally considered major, if conflicting, components of the incentive towards inquiry. Can we assume that substitution of social motives for the latter will in itself provide a sure foundation for administering the economic resources available for research? The quality of scientific research depends on on the quality of the thought behind it. Scientific inquiry is, therefore, promoted like all other human activities by certain freedoms of thought and action. Only when these are clearly defined can the organisation of scientific research be integrated with the life of the community as a whole or with any part of it. Would it not, therefore, be more appropriate to the presentation of a case for these freedoms that this characteristic human activity, and the values which promote it, be understood and proclaimed?

That freedom of thought is essential to the existence of a live culture is universally recognised, but the nature of this freedom is only fully appreciated by those who exploit it. So far this freedom has been safeguarded by the diverse and often opposing interests set within the framework of the existing social system. Now when this system is itself due to be replaced by one which will claim to be based on explicit motives, the need to formulate the intellectual freedoms on which scientific research is based becomes even more important. A study of the heuristic method in thought is therefore relevant to the future status of science, as well as being of absorbing interest.

SUBJECTIVE ASPECTS OF RESEARCH

The human mind, despite the obtuseness for which it is renowned, possesses an amazing flexibility, and it is this combination of flexibility with rigidity which gives it the exceptional ability we are about to discuss. The simplest exposition of the nature of this ability will be found in *The Nature of Explanation* by K. J. W. Craik.

In what follows an attempt is made to distinguish certain subjective psychological aspects of research thought by reference to the objective forms of extant research work. It is suggested that some features of thought are common to the process whereby a number of notable advances in scientific knowledge were made and that these constitute *modi operandi* within the scope of heuristic method.

First, however, it will be necessary to discuss the nature of an inquiry into heuristic method in order to show its relation to the scientific method of verification. Briefly stated, scientific method is concerned with objective verification; but, since we are a part of the objective world to which these methods of verification have been found to apply, it is legitimate to ask whether the mind bent on systematic investigation itself exhibits certain consistent, ordered, and characteristic processes.

Two main types of inquiry are already recognised—investigation and research. Investigation involves the application of existing knowledge to the development of new processes. The type of thought required for this is an exact understanding of the relevant systematic knowledge together with sufficient conviction to apply it. Such thought is concerned with changing the external world to conform to the pattern of certain ideas. It is therefore supported by an aggressive or assertive disposition Research on the other hand requires a submissive approach to nature and a labile mind ready to cast facts into a number of conceptual forms

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[1] The Oxford English Dictionary quotes E. Caird (1877) on the philosophy of Kant: "The ideas of reason are *heuristic* not ostensive; they enable us to ask a question not to give the answer."

Within research two distinct types of activity can be distinguished—those pieces of research which consist … dge, and those … of ideas capable … the relationships between certain phenomena as yet unintelligible in terms of the classical theory of one or other existing science or thought discipline Both types of research activity contribute to the advance of science, but while the former, exemplified by the systematic examination *of the chemical properties of new substances, is fully* recognised because the methods it employs are widely understood and explicit, the same is not true of the attempts to form intelligible patterns of ideas to explain the properties of a newly discovered system

This was the heuristic method of the early founders of the different branches of science—such men as Pasteur and Newton—for they propounded an intelligible set of relationships which had no connexion with the prevailing methods of interpreting the different phenomena which

in breaking new ground new concepts have to be postulated *which express (or at first merely signify)* the experience of the experimenter An example of this

disorders" by Trigant Burrow (*Psychosomatic Medicine*, 1941, 3, 174)

RESEARCH BASED ON EXPERIENCE

To the casual—or even the interested—observer the reasons, motives, or object which prompts the research are not easily comprehended even if in the early stages they are consciously formulated, for the experiences which are the subject of attention may not be readily discerned without much time consuming effort on the part of the observer, and thus the postulates containing designations of the entities under investigation will not be understood until the pattern of relationships is fully disclosed In the instance cited above however the bridge between existing knowledge and the phenomena under investigation is provided by the admirable work of Flanders Dunbar, who, by defining the field of psychosomatic studies, has provided a background to what would otherwise be a number of isolated and apparently somewhat eccentric investigations By this work Dunbar will have done much to strengthen the conviction of the young investigator in this field who becomes acutely aware of a set of factors operating in the sphere of his experience, factors which in the emergent state of his mind are lacking explicit statement

Such is the experience of many research workers in the early stages of their work At this stage they have nothing but faith in themselves to rely on, and, since they cannot know whither they are ultimately bound they cannot lay claim to the financial or other support of any particular set of interests This faith in oneself is the strongest asset a man can possess, and when it is combined with a thrill at discovering the patterns of the universe he is strongly drawn towards research To him the thrill of discovery comes when a pattern is perceived and not necessarily when his isolated discoveries become clearly related to the existing structure of knowledge In the strict sense of course there will always … of contact but this is merely a … experience and not a neces … this type of research The … his experience which correspond to the features of the phenomenon under investigation constitutes the most difficult task before the worker who adopts this type of approach For the successful accomplishment of this stage he must rely on his own ability to mirror Nature as he experiences her but the extent of his success will depend on how far he has grasped the fundamental criterion of scientific method—verification by objective demonstration At this point versatility of approach may be decisive During all this period, readiness to relinquish the most beautiful hypotheses is a constant requirement, since it is in the struggle between the projected image and the forces of practical experience that the true pattern emerges

In recent years original work along these lines has … ysiology by E F Adolph … particularly in the field of … N R F Maier (*Studies in Abnormal Behaviour of the Rat*) and J H Masserman (*Behaviour and Neurosis*) in the sphere of animal psychology It is likely that much more work, especially in the biological sciences, will develop along these lines because biologists (see J H Woodger's *Biological Principles*) and latterly medical men have felt the need to break away from the conceptual forms of thought

and chemistry, are a firmer starting point from which to approach the problems of the biological sciences than the concepts derived from experience with biological material This view goes so far as to assert that ultimately the material of these sciences will be explicable in terms of the concepts developed in the physical sciences This attitude ignores the existence of integrative levels which require separate treatment, *admirably* discussed by Joseph Needham in *Time the Refreshing River*

It is moreover becoming increasingly evident that the basic order of the universe (which incidentally during the growth of the physical sciences was regarded as largely chaotic) may ultimately be interpreted in terms of the less widely understood concepts of the biological sciences This is because the assymetrical aspect of time is an essential component of all living systems These at present include the concept of the organism, the relationship of the organism to the environment, the principle of homeostatic equilibrium within the system of the organism, and the idea of a hierarchy Such concepts have been used with great effect to supplement biochemical evidence on the rôle of vitamin B_6 (pyridoxine) by C P Richter and C D Hawkes (*Amer J Physiol* 1940, 129, 159) It is important to realise, as Richter (*Psychosom Med* 1941, 3, 105) himself points out, that knowledge of the close relationship between dietary selections made by animals and their internal needs offers us a new tool for the investigation of many phases of the nutrition Had this method been available, he continues, we could have established many years ago, long before the advent of modern biochemical methods, that the adrenal glands are concerned with the regulation of sodium metabolism Likewise we could have discovered the calcium regulatory function of the parathyroids, &c This method applied to the study of vitamin B deficient rats has already

of chemical combination

TRANSFER OF CONCEPTS

One other research method which is coming into prominence as the field of biological inquiry broadens is the transfer of concepts from one science to be used as a method of research or interpretation in another A striking example of this is J H Quastel's study of soils by perfusion methods long used in physiology in the study of isolated organs In Quastel's work the soil is treated as if it were a living organ system, which in fact it is An early example of this use of concepts from another science is suggested by the following quotation from A D Ritchie's *Civilisation Science and Religion*

> Harvey's doctrine, that the heart acts as a pump driving the blood round and round the blood vessels always in the same direction, was immediately intelligible to his seventeenth century contemporaries who knew about artificial pumps and how a non return valve works Though ancient Greek writers had taught

him much about the blood-vessels, it is doubtful whether they would have understood what he was talking about, because pumps and valves did not exist in their day."

Harvey was aware of the principles of a pump, and in his anatomical researches used this conception as a method of interpretation. In the instance quoted Quastel used the concept derived from another science to derive a new method of investigation. Maier and Schneirla's (*Principles of Animal Psychology*) skilful use of physical concepts alongside those derived from the study of animal behaviour to elucidate the principles of animal psychology in a phylogenetic treatment of the problem is an outstanding example of this transfer of concepts used boldly as method of interpretation and is a success because they recognise the the integrative levels in their subject.

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This description of heuristic methods distinguished from among the leading lines of research today may help to focus attention on the way scientific research is continually being expanded in scope by the use of new methods of mental approach.

TEACHING AND PRACTICE OF CHEMICAL PATHOLOGY

THE chemical pathologists of the London Teaching Hospitals have prepared the following memorandum on the organisation of chemical pathology departments from the points of view of both teaching and practice, drawing attention to the present unsatisfactory position of chemical pathology in the curriculum and in the final examination.

THE GOODENOUGH REPORT

With certain qualifications we agree with the following recommendations of the Goodenough report :

(*a*) Chemical pathology should form a separate department in the division of pathology and should be under the direction of a professor, reader, or senior lecturer. To this we would add that the chemical pathologist should be a full member of the medical committee of his hospital.

(*b*) Proper assistance and equipment should be provided. The staff proposed in the Goodenough report of one departmental head, one senior lecturer, one resident assistant, two demonstrators, one of whom is part-time, six technicians, and one secretary typist, for a thousand-bed hospital, is based on the assumption that much of the routine chemical work will be done in the department of clinical pathology. If our alternative recommendation (see below) on this point is accepted it would necessitate some extra staff in the department of chemical pathology, which would best be provided by the appointment of an additional science graduate, a type of worker whom we consider specially desirable in this department. An extra junior technician might also be required. If many tests are to be done on patients in the laboratory, a nurse will be needed. Bench space should also be available for research scholars working on special problems.

The selection of suitable technicians for the department of chemical pathology is a difficult problem, but we would recommend that whenever possible they should be of an educational standard such that they could read for a scientific qualification, and that they should be given every encouragement to do so.

(*c*) Undergraduate teaching in chemical pathology should be given in the form of a short introductory course at the commencement of the clinical period, with other lectures and lecture-demonstrations spread over the remaining clinical years.

(*d*) Proposals for the training of pathologists allow a period of three to four years, which are to be divided between the four departments. A further period in the special department is required by anyone desiring to specialise in one branch. This scheme is well designed to create pathologists with experience in all branches to take complete charge of smaller laboratories. It is doubtful whether such an arrangement is equally suitable for those who intend to specialise in chemical pathology, and we would emphasise the importance of making the training as elastic as possible, as in fact has been suggested in the Goodenough report (chap. XVII, p. 218, para 34).

There is however one main proposal in the Goodenough report with which we cannot agree—that which allots the "routine" chemical work to the [illegible] In our opinion this arrangement woul [illegible] disadvantages :

(1) The chemical pathologist would be largely cut off from the clinical material which should form the principal source of his inspiration, and his teaching of the basic principles and routine methods would tend to lose contact with current practice. If, for example, no routine blood-urea estimations were performed in his department, both the technique and the interpretation of this test would eventually become something remote from his personal experience.

(2) The standard of chemical work would be lower.

(3) The tendency to specialisation in pathology, recognised in the report, is inevitable, and it is a retrograde step to aim at a type of pathologist who has, by definition, avoided specialisation. This may be necessary in the smaller hospitals but it is not an ideal solution for the large teaching hospital.

(4) In a hospital of a thousand beds the amount of routine work in hæmatology and bacteriology will be so large that the addition of routine chemical tests would be an excessive burden on the department of clinical pathology.

(5) The liaison between pathologist and clinicians, on which great emphasis is rightly laid, will finally depend more on the growth of a generation of clinicians who are interested in pathology than on the creation of a non-specialised pathologist.

We are therefore strongly in favour of son [illegible] tion of this proposal such as one of the [illegible] discussed in the next paragraph.

RELATION OF ROUTINE LABORATORY TO MAIN PATHOLOGY DEPARTMENTS

While wide variations in the pattern of organisation of the pathology division in teaching hospitals may be desirable or necessary, the geographical position of the laboratories is an important factor in most cases. So far as chemical pathology is concerned two principal alternatives are in operation at this time :

(*a*) The chemical pathology laboratories are all situated in one place, which may be in the hospital, medical school or special institute of pathology or biochemistry. In this case we suggest some arrangement, such as that mentioned in chapter VIII, p. 143, para. 22, of the Goodenough report, whereby specimens and requests arriv at a central sorting office with subsequent despatch to th appropriate department. In such circumstances th specimens are often collected by students or house officers, who are responsible for their proper delivery It is important that adequate accommodation should b provided in the laboratory for certain special tests o inpatients and on outpatients which cannot be done satisfactorily in the wards—for example, basal metabolism estimations—and other procedures, such as sugar-tolerance test and urea-clearance tests, are better carried ou in the laboratory. This requires the provision of severa suitably equipped patients' rooms, which have prove of great value in at least two hospitals where this arrangement is in use. It also requires the help of at least on nurse.

(*b*) In certain cases another laboratory, suitable for clinica pathology, is situated in the hospital, the main laboratories being elsewhere. Many routine chemical estimations are then carried out in this clinical laboratory, a arrangement which is convenient for patients an clinicians but which makes adequate supervision of th work more difficult. We suggest that such hospita laboratories should be organised by the heads of th departments of bacteriology, clinical pathology, an chemical pathology, the director of the division o pathology being the responsible administrative office The chemical pathologist should, however, always b responsible for work of a chemical nature which migh well be undertaken by a specially appointed senio member of his staff.

LIAISON BETWEEN CHEMICAL PATHOLOGY AND PRECLINICAL BIOCHEMISTRY

As will be seen in our recommendations on the curriculum we recommend that detailed practical instructio should not be given during the years of clinical study so that it is desirable that preclinical instruction shoul include methods actually used in chemical patholog

For this reason the person responsible for the department of chemical pathology in a medical school should attend staff meetings of the preclinical biochemical department of that school where this exists. Where the school does not possess a preclinical biochemical department other means should be adopted of effecting a close liaison between the department of chemical pathology and the biochemical department in which the students have received their preclinical instruction. It is important that there be continuity in the teaching of chemistry and biochemistry throughout the students' career.

CURRICULUM

We propose the following curriculum, which is based on the assumption that a total of 21 hours' instruction during the clinical period should be adequate.

(1) An introductory course of six hourly periods, early in the first clinical year, dealing with the general principles and including instruction on the collection of specimens [illegible]

(2) A general course of eighteen hourly periods during the second and third clinical years, covering the whole subject of the application of chemical methods to clinical problems.

(3) A limited number of lectures on special aspects and recent advances given during the pre-registration year.

While detailed practical instruction should not be emphasised during the years of clinical study, facilities should be provided for students to acquire some practical experience.

EXAMINATIONS

An analysis of some questions set in the final pathology papers during a period of more than 10 years gives the following results:

Examination	*Questions analysed*	*Entirely chemical*	*Partly chemical*
MB, BS	167	8	24
MRCS LRCP	281	25	16

In the MB, BS examination a complete absence of entirely chemical questions was noted over a particular 4-year period. In our opinion this position as a whole is discouraging to the teachers and is not in line with the importance of biochemistry in current medical practice.

We therefore recommend that in every pathology examination chemical pathology should receive representation equal to that accorded to the other three branches, and that the chemical question should be set by a chemical pathologist appointed to the board of examiners for that purpose. If the pathology examinations became internal, as recommended in the Goodenough report, there would be no difficulty in arranging for the chemical question to be marked by the chemical pathologist, who should also take part in any practical and viva-voce examinations.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED JUNE 16

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1314; whooping-cough, 1130; diphtheria, 438; paratyphoid, 1; typhoid, 5; measles (excluding rubella), [illegible] uenzal), 380; puer-[illegible] fever, 17; polio-[illegible] cephalitis lethargica, [illegible] 9; dysentery, 46; ophthalmia neonatorum, 57. No case of cholera or plague was notified during the week, but [illegible] diphtheria, 28; measles, 61; whooping-cough, 13.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 4 (0) from measles, 1 (1) from whooping-cough, 5 (0) from diphtheria, 45 (4) from diarrhœa and enteritis under two years, and 14 (2) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 238 (corresponding to a rate of 33 per thousand total births), including 30 in London.

LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY

ANNUAL MEETING

At the annual meeting of this society on June 20, Sir ERNEST ROCK CARLING, who has succeeded the late Sir Cuthbert [illegible] in reviewing the year's work [illegible] for assistance had increased by [illegible] he joint committee which incl[illegible] of the society and of the Medical Defence Union had been extended to bring in the Medical and Dental Defence Union of Scotland. All three societies were agreed that it was of great importance wherever possible to keep disputes between members of the profession out of the courts. The MDU favoured arbitration under the Arbitration Acts, but the society believed this to be less satisfactory and more expensive than recourse to the courts when one or the other method could not be avoided. It looked as if the recommendations of the Goodenough report if implemented—as they were likely to be—would require an amendment of the Medical Acts, and the joint committee, with the legal advisers, was considering whether, if an amending Act was necessary, the time had not come to make other changes.

One point on which the society, as a result of its experience, desired to insist was that information should be given to it as soon as any case appeared above the horizon. Some members referred their affairs to solicitors before consulting the society, and even the best-intentioned efforts of such solicitors not uncommonly prejudiced the proper conduct of affairs later by the society's legal advisers. Another matter of great importance, especially now that a deceased doctor's estate could be attacked, was the keeping of accurate records. The importance of the radiogram in the treatment of fractures and the like had been often emphasised; from the legal point of view it also had its value as a document of record.

Another point which had been brought home to the society was the desirability of a medical man, when he varied his proposed treatment or discovered that he had made some mistake, at once explaining his action or his mistake to the patient's relatives in the frankest manner. The importance of all practitioners belonging to a protection society had been often stressed. Disasters occurred even in the most skilled and careful hands. In two serious actions during the year, which had cost the society a great deal of money, they could feel nothing but sympathy for the doctors concerned; the same misfortune might have happened to any one of themselves. Finally, the society deprecated settlements without its advice. Such settlements were as likely to prejudice a man's practice as an unsuccessful defence, and the society had had a spate of actions from a part of the country where such unadvised action had been taken.

Mr. W. M. MOLLISON, the treasurer, said that the investments of the society now amounted to just over £100,000. The annual cost per member—a fluctuating figure—was 17*s.* 10*d.* in 1944, compared with 13*s.* 9*d.* in the previous year, and of this sum 4*s.* 11*d.* represented legal costs in defence of members and 6*s.* 1*d.* adverse costs and damages. Sir ERNEST CARLING was unanimously re-elected president, and the other officers and retiring members of council were also re-elected.

In speaking to a vote of thanks, the President mentioned that already a good many difficulties were being brought to the society's notice by unfortunate practitioners who had been away from their practices on national service for four or five years. It was true that a protection of practices scheme was in being, but, with the best will in the world, it became increasingly difficult to operate as the period of absence lengthened. It was the experience of the last war that the man who stayed in civil life could take care of the practice of his neighbour with great ease for the first year, with a little difficulty in the second year, with more difficulty in the third year, and by the fourth year it became practically impossible. This was because a generation arose which knew not the absent practitioner. The society would be glad to help returning men with the best advice it could give, even if—as seemed probable—a large proportion of the disputes which were likely to arise would have to be settled elsewhere.

In England Now

A Running Commentary by Peripatetic Correspondents

In a small ship one's companions are few and always present. In a very short time everything is known about everyone's interests, thoughts, and topics for discussion. Conversation therefore becomes almost a ritual in its sameness from day to day; its predestined course is known to all present and arguments on far-reaching subjects are avoided. This stylised intercourse is well suited to our crowded way of life, but a new companion is often desired on whom to pour out one's soul. The Lower Creation is particularly adapted for this—its members can be trained to show some affection and appear attentive to a lengthy discourse.

In every port there are cats that join the ship for as long as they feel their health or interest requires a sea voyage. These cats vary very much in physical appearance, character, and experience. One of ours, suitably arrayed in a lifebelt, had the distinction of being the first British cat to sight the coast of Normandy. It was brought out in the evening before D-day to view the scene, and then replaced in the letter-box so that it would not leave the upper-deck. It left immediately on our return, presumably to tell its tale to less adventurous fireside cats, and make them think themselves accurs'd they were not here. Its successor, a young and too vigorous male, was subjected to unilateral orchidectomy, the cause of which was a fear of its probable behaviour on foreign soil, combined with a disgraceful failure to diagnose an undescended testicle. Its affection for us was unfortunately all that was diminished. Dogs are rare visitors to the ship; their larger excretions reduce their popularity. A cat deceives one for long periods into believing it can live without defæcating.

Recently we have relied on birds for companionship. Migrants such as flycatchers, martins, warblers, and, on one occasion, an oyster-catcher, have provided fleeting company. A homing pigeon stayed with us for a week-end. It was treated with all possible kindness, and when released carried between its legs a specially made chart of the adjacent British coast, but to our dismay it flew on a reciprocal course, back to its Nazi home. Our last pigeon was reared from a nestling—a squab, I think it would be called by pigeon-fanciers. After its capture beneath a pier it flourished on a diet of bread-and-milk and peas, but its large and forcible feeds stopped its hungry squeakings. It learnt to follow us for a stroll on shore, where its agitated squeaks attracted the maternal attentions of meadow-pipits and reed-warblers. Finally came the time when it could flutter. Regular practice was given on the quarter-deck. Curiosity led it from object to object—from the mine-sweeping winch to the fairleads—until on V-day, when it was left unattended during Mr. Churchill's speech, it took a last poignant and fatal flight into a pot of white paint. Splicing the mainbrace was saddened by the sight of a whitened dove in a beer case, floating like a Viking on the waters of the cold North Sea.

Now we have no companion for our post-war sweeping. Perhaps their martial ardour has evaporated in the pleasures of peace-time ashore.

* * *

Examining, so the cliché has it, is a soul-destroying job; and so I also used to think, until I had the joy of examining with MacTavish. Now that he has, at the age of 84, at last retired, I realise what I have lost. He only retired because his eye doctor insisted that he must. Some years ago it was necessary to remove both the lenses from MacTavish's eyes; he also has asthma, and, from all appearances, considerable trouble with his ancient bowels. But "Eh, laddie. Ah've got a grand heart and stomach!" he told me once when I found him, during an examining tour, with a bad cold and a temperature of 101°. We travel, you see, twice a year from London to Edinburgh and Glasgow and over to Dublin, living in a welter of trains, taxis, scamped meals, hotel beds, examination papers, rain, fog, and other discomforts which try even a whippersnapper like me who am still on the right side of 60. But MacTavish seemed to thrive on this kind of thing. He loved giving orals—and we oralled all day without intermission except for meals and the cup of tea, which, in Scotland, even in war-time, is apt to be as blackish-brown as the old char-cum-cook who always brought it at the mo inconvenient moment. MacTavish would give his te and certainly the war-time cake which accompanied i to whatever student he happened to be oralling, espec ally if she was a girl.

In view of this soft spot of his for the "lassies," an because the loss of both lenses does not help the placin of marks accurately in the mark sheet, it was one of m jobs to see that each student got his own marks. The were, for example, duds who were intelligent enough t listen eagerly while MacTavish, sorry for their appallin ignorance, gave them, not an oral, but a dissertation o his favourite topic, and then, very pleased with his ow performance, put them in the second class. I used t try, when I first met MacTavish, to protect him fro what the textbooks call environmental influence These could be quite severe at times, as when we boarde in winter the cattle boat from Glasgow to Dublin, o which MacTavish used to fortify himself immediatel with large quantities of (before the war) cold chicke salad, marmalade, and toast before retiring to his bun When, during the war, we flew to Belfast in one of tho delightful little De Havilland Dragons, some of whic were the very machines which did such excellent evacu tion work at Dunkirk, MacTavish starved himse instead. I don't suppose he could see much beyon the next seat in the plane, so he could not be thrilled the take off in the fog and the sudden emergence a fe minutes later into a world of sunrise pearl and go with the snow-topped hills of Galloway piercing t carpet of mist below; nor could he sneak, in the da when the planes were blacked out, rapt illegal glimps of Anglesey and North Wales as we flew back to Live pool; he used to enjoy instead a nap for an hour and half. But once in Dublin—well, there were bacon a eggs every morning and cream too; for MacTavi there was even cream on the top of a cream ice.

But that is all over now. No longer shall I get do late for breakfast to find that MacTavish, unable to s that there is only one pat of margarine and one small p of sugar for us both, has cleaned up both and gone aw to smoke a stramonium cigarette. No longer shall feel a pound note being pressed, with entire disregard my embarrassment, into my hand, with the adjuratio "For your dear wife, laddie; get her something prett ye know ah canna see what's in the shops." No wond the students, teachers, hotel porters, and everyone el are sad. At one hotel which we visit regularly the he waiter must be nearing MacTavish's age. He has air which makes you feel, when you slip him a tip, th you may be insulting Monsieur le Duc. "Excuse m sir" he said to me this time; "But what has become the *other* old gentleman who used to come round wi you?" My new colleague, who is a child of 38 or so, h no more grace than to chuckle all the way to the ae drome. But if ever I do attain to the dignity of "t other old gentleman," I hope I may preserve the courte the straight (and uncorseted) back, the jolly laugh, a the jaunty voice which make the physical framewo of my memory of MacTavish.

* * *

This association-of-ideas business has always i trigued me. The whole process was set going, so f as I was concerned, by the vehemence of the gentlem at the Amalgamated Engineering Union Conferen who criticised the treatment of the tuberculous in t country "under Belsen conditions" as he picturesque put it. Those "horror" pictures had reminded m in a vague sort of way, of the poor distorted lim and bodies that we see in our orthopædic departmen A Canadian medical officer had asked me the previo day whether spinal tuberculosis was at all common this country—it appeared that he had never seen case. I wondered then whether it might not be possi to arrange for a Parliamentary delegation to visit, sa Alton or Chailey, where such cases could be se albeit in their most pleasing, and least horrifying, s roundings. Perhaps we could then hope for somethi active to be done about the nation's milk-supply.

CORRIGENDUM.—The following addition should be made the references given by Florey and Heatley (June 16, 19 p. 748)—Garrod, L. P., Heatley, N. G. (1944) *Brit. J. Su* 32, 117.

Letters to the Editor

CLOSURE OF HOSPITAL BEDS

SIR,—In the *Times* on June 14 Dr. H. M. C. Macaulay, MOH for Middlesex, wrote saying that his county had closed 150 sanatorium beds and that more closures would follow. He added "the whole fabric of the anti-tuberculosis scheme is threatening to collapse for lack of staff." On the 19th Dr. H. P. Newsholme, MOH for Birmingham, commenting on this statement, spoke of "a catastrophe ahead unless nursing and domestic staff are quickly made available." These weighty pronouncements only differ from the cry of units all over the country in that the number of beds that are closing is greater in the areas these officers represent.

If the only alternative to closure is heavy overwork of the remaining staff, all honour to those who refuse to exploit youth and health to bolster up. for a brief moment, a system so obviously cracking.

It is impossible to believe there is no way out of the impasse, provided that a stream of fresh thought is allowed to play freely round the whole subject of hospital [illegible] methods do not toler- [illegible] the antiquated organ- [illegible] fatigue that is found in every type of hospital today.

The first thing that must be scrapped, on the nursing side, is the demand for a double life of full-time paid employment with preparation for a professional career. [illegible] to run the coun- [illegible] tudent-nurses are [illegible] pensation for loss of health. Hospital service has never been adequately considered as a possible front-line risk; except, perhaps, by parents of prospective recruits.

Dr. Newsholme holds that a "change of heart" is called for from the young women of today. He is right, perhaps, about the change of heart—but not as to the source from which it should come! The public, guided ever by the medical profession, has stood aside and allowed the evil to exist and increase till breaking strain has been reached.

The anti-tuberculosis scheme has been singled out for notice, but mental hospitals and institutions for chronic [illegible] ission to investi- [illegible] " be considered [illegible] which produced [illegible] poses come into [illegible] try does not lack either the brains or the interest to reconstitute a service which has always been highly valued. Previous inquiries have been too limited in scope and too tightly bound by traditional thinking.

Moor Park. ESTHER CARLING.

PLASMA IN STARVATION

[illegible] had settled, and there were no catastrophes.

I cannot agree that œdema of the legs was due to thrombosis in any but exceptional cases, in view of the uniformly excellent response to plasma by intravenous drip. This was given slowly, 2 pints at a time. The œdema disappeared, or was greatly reduced, within 24 hours; in severe cases a further 2 pints was given after 24 hours had elapsed, with satisfactory results. The œdema was often pronounced with a serum-protein of 5·5–6·5 g. per 100 c.cm; whereas in cases with a serum-protein 4·5–5·5 g. it was often slight or even absent. In only one case did the circulation show signs of overloading after plasma; this was in a man with mitral stenosis, who had been on a forced march in Germany for 2½ months.

It is the purpose of this letter to point out the striking subjective improvement felt by patients given plasma; even patients who had unpleasant reactions (vomiting, rigors, &c.) later spontaneously and emphatically declared that they had not felt so well for months. This effect was so dramatic that I have been giving plasma to malnutrition cases without œdema; the results again were excellent. The feeling of well-being following plasma in these cases does not appear to be widely appreciated. Taken with the finding that the degree of œdema is not necessarily proportional to serum protein level, one has to consider whether the proteins are in fact the most important constituents of serum for this type of case.

These findings are in keeping with those of Dr. Janet Vaughan at Belsen, where plasma gave very satisfactory results in contrast to the hydrolysates (*Lancet*, June 9).

Wakefield. J. R. EDGE.

OXFORD AND CAMBRIDGE UNIVERSITY VOTERS

SIR,—Voting in the Oxford and Cambridge constituencies will not be in person, but by means of voting papers issued by the Vice-Chancellor as Returning Officer. They will be posted to electors by June 29. Any elector who wishes to vote and has not received a voting paper by July 3 should write immediately to the Registration Officer at the University Registry, giving the address to which a voting paper is to be sent.

This does not apply to persons for whom proxies have been appointed, or to those who have applied for registration as Service postal voters.

W. W. GRAVE,
Registration Officer.

University Registry, Cambridge.

PORTABLE SURGICAL HOSPITALS FOR CHINA

SIR,—Under this heading the War Organisation of the British Red Cross and Order of St. John has received a request for help from China.

By a "portable surgical hospital" is meant a mobile surgical team, operating from tents and living under canvas, ready to advance with the combat troops of the Chinese Army. It is planned to have one portable surgical hospital with each division of troops, and we have been asked to provide four. The need is urgent and great, and the War Organisation requires the services as soon as possible of twelve doctors (men with surgical experience) and six mechanics if possible with first-aid training to complete the teams required.

Applicants, [illegible] fit, should apply in [illegible] to: Dr. H. Gordon [illegible] Organisation of the British Red Cross and Order of St. John, 14, Grosvenor Crescent, London, SW1.

I trust that the response to this appeal will be quick and effective.

PHILIP CHETWODE,
Field Marshal;
Chairman, Executive Committee.

War Organisation, British
Red Cross Society and Order
of St. John of Jerusalem.

HOT BATHS AND HUMAN FERTILITY

SIR,—On the effects of warming the testicles in mammals, Mr. Baker writes in his letter of June 16, "MacLeod and Hotchkiss have been the first to make relevant experiments on men." Their paper was published in 1941. In 1940 J. Bauer and G. Gutman published a paper, "*The effect of diathermy on testicular function*" (*Urol. cutan. Rev.* 44, 61), referring to investigations made several years before which had been delayed by external (political) events. In the summary they stated: "In all cases, however, necrospermia was observed after treatment and was obviously caused by heating of the organ. It disappeared shortly after treatment was suspended."

I was asked to investigate the male partner in a case of childless marriage at the beginning of May. I quote from my letter written to his doctor on the 17th: "It is of particular interest and importance that his work, as foreman in a refrigerator factory compelled him to work in overheated rooms (110° F!) two full days every week for several years until quite recently. This might well have caused a temporary impairment of the vitality of the spermatozoa. At any rate, an examination of a sample of fresh seminal fluid under special precautions (May 5, 1945) gave a satisfactory result."

This might be of interest from the point of view of industrial medicine.

London, SW3. V. C. MEDVEI.

STRESS FRACTURES

SIR,—I cannot accept Dr. Morris's letters without protest. In his first, he challenges my experience and my statement that "fatigue" fractures in general "are essentially incomplete." When I answer this, using his own figures (and ignoring his unfounded assertion regarding experience), he shifts his ground and argues from a separate sentence altogether. He has already shifted the argument from the improbability of the existence of true fatigue fracture of the first rib to the frequency with which he has found displacement in fractures of the metatarsals in soldiers. Very well—I will agree that my sentence "there is never displacement" should have read "there is very seldom displacement" or "with the exception of fatigue fracture of the metatarsals there is never displacement." But this was only a minor point in a long and considered argument against the existence of "fatigue" fracture of the first rib, as it was postulated by Alderson.

Even Dr. Morris will, no doubt, admit that the mechanics of the foot places metatarsal "fatigue" fractures in quite a different category from those occurring in the other sites which I have described. In the former, bones affected in the main take, or have applied, their stresses and strains in a direction at or almost at a right angle to that in which the latter bear theirs. Thus there is in metatarsal "fatigue" fracture an additional factor (which might be termed insufficiency of the foot) which does not operate in "fatigue" fractures in general. And it was fatigue fractures in *general* to which I was directing my argument at that point in my letter.

I agree with my colleague, Mr. Sayle Creer (June 16), that one cannot distinguish between traumatic fracture and "fatigue" fracture of the metatarsals "only on the skiagram." Nevertheless, let us not become "wise after the event," for it is important to remember that the skiagram, together with the history of absence of trauma (violence), does have the greatest value. It may only confirm a diagnosis already made by the orthopædic surgeon: but even so such confirmatory evidence is most important, and without it the diagnosis may still be open to question for a considerable period. For the average clinician the evidence of the skiagram is more important still, since it may afford a firm diagnosis immediately, where none existed before.

Manchester. J. BLAIR HARTLEY.

A PARENT AT HOSPITAL

SIR,—It is vain now to regret that Lady Russell's lamentable story should be meticulously remembered and prominently published so long after the event, but it is not vain to consider whether the most pertinent conclusions have yet been drawn from it.

Courtesy, sympathy, clinical acumen, and a sufficiency of equipment and staff may reasonably be looked for at any hospital prepared to admit a sick child and all these seem to have been "in short supply" at a certain cottage hospital on a certain date. Lady Russell assures us that they would all—especially the human virtues—have been found in abundance in nursing-homes and consulting-rooms, and she impugns "our hospital system." I should not myself have supposed these group-characters to have been so constant, but if it is true that to work in consulting-rooms and nursing-homes encourages humane, gentle, and finished nursing and clinical work, and that to work in hospitals does not, it seems obvious that a wise public and a wise profession must cherish and preserve its consulting-rooms and nursing-homes as a chief repository of gracious and perfected medical and nursing art. The practice of public institutions will scarcely be raised to the same standard if the standard itself has first been carefully destroyed.

All this, of course, assumes that Lady Russell is right in her rather sweeping generalisations. But however diverse in their manners I am sure that hospitals and nursing-homes are one at heart in deploring the continual presence of a mother at the bedside of a sick child for whose nursing they are responsible, and many nursing-homes would say so in the clearest terms. It is quite true that young children should not without the most compelling cause be taken from their homes and put in strange wards or bedrooms; it is also true that a mother able and willing to nurse her child and to take full tour of duty may be that child's best nurse; but I should have thought it was almost universally known to mothers, nurses, and doctors that the triangle mother-nurse-sick child has no cohesion and as a dynamic system simply will not work. What can an infant make of a mother who has become a mere observer? The poor child is perplexed beyond bearing and mother and nurse are both in false positions. The wise mother clears out even from her own night-nursery, at least until the nurse's authority is established, and then enters with diffidence. If she does not, the very conflict ascribed to "our hospital system" occurs in the mother's own house, but with the child at home it is at least more easily solved.

The remedy, surely, is not to throw the wards open to mothers but to provide such a body of home-helps and visiting or domiciliary nurses that young children with acute non-surgical illnesses can be nursed and treated at home, and only those whom, for technical reasons, it is impossible to diagnose or treat at home need be admitted to hospital.

London, NW3. LINDSEY W. BATTEN.

THE GOODENOUGH REPORT

SIR,—In his letter of June 2, Sir Ernest Graham-Little suggests that the recommendation for the foundation at Oxford of "an undergraduate clinical school to train teachers, investigators, and consultants rather than general practitioners" was grafted by the Goodenough Committee upon the university, and that the recent letters in your columns criticising this proposed development at Oxford are symptomatic of a revolt against the findings of that committee. This, however, is incorrect. In pp. 123–5 of the Goodenough report it is clearly stated that it is the *wish of the university* that a medical school of this specified kind should be formed. The proposal is examined at some length, criticised, and reasons given for the committee's recommendation of support for an experiment which is considered worthy of trial.

London Hospital. DOROTHY S. RUSSELL.

SIR,—Dr. Shaw ignores the more serious instance cited by me (June 2) of the Government's application of financial sanctions to enforce changes in the medical curriculum at the universities. Does Dr. Shaw really wish a Government department to decide the scope, duration, and content of the training required to achieve a degree in medicine of London University? During the debates in the House of Commons on health services there was considerable support for the admission of irregular practitioners, osteopaths, herbalists, &c., to take part in the new services. A society calling itself the British Health Freedom Society, boasting (June 14, 1945) that 9000 people have joined it, has as its object (advertised with frequent repetition in the *Times*) the admission of members of a number of these irregular "healing" cults to the new health service on equal terms with registered medical practitioners. Government departments are largely controlled by political considerations. A drive for this recognition might very well be successful with a Government appealing for support at a general election.

London. E. GRAHAM-LITTLE.

HELP FROM AMERICAN WOMEN DOCTORS

SIR,—In July, 1940, Dr. Esther P. Lovejoy, chairman of the American women's hospitals board of the American Medical Women's Association, sent a cheque for $500 to the British Medical Women's Federation to be used "for the relief of civilians in bombed areas." Further sums were promised, and the Federation was asked to administer the fund. Every month a cheque for a minimum of $500 has been received—always for a larger amount during intensified bombing. In all £12,280 will have been sent to us, for we learn that we are to continue to receive $500 a month up to the end of this year. To commemorate VE-day we received by cable a special thank-offering of $2000 to be divided between four named hospitals. In her letter confirming this, Dr. Lovejoy writes: "It has been a great privilege to be of a little help in our common cause. We are very lucky indeed as a nation to have been beyond the reach of bombs this time, although some little ones from Japan are floating in on the breeze to our western coast. The people in England have suffered continuous casualties for five years and all we could do was to help them a little."

Throughout the war the money has been used to aid cases of special hardship in bombed areas in all parts of Great Britain and Northern Ireland, in hospitals, institutions, and private homes, and we shall continue to help in this way until the fund is closed.

We have endeavoured adequately to express our profound gratitude and appreciation to our medical colleagues in America, but we feel that this outstanding example of generous and practical sympathy on the part of women doctors overseas deserves to be more widely known. It will be one of the many bonds of friendship between this country and the United States.

JANET M. CAMPBELL,
Medical Women's Federation. President.

INDULGENT CERTIFICATION

SIR,—Mr. Scott's letter is courteous, timely, and valuable. In so far as lax certification can be controlled by the practitioner and by the medical referees, it must be so controlled.

But neither Mr. Scott nor the writer of your leading article seem to me to appreciate that the real cure of indulgent certification lies in the hands of those persons who are responsible for "morale" in the factories and in the country as a whole. I do not advance this view in mitigation of the notorious laxness of much medical certification. I advance it because the condition requires radical cure and not mere palliation.

Mr. Scott's letter makes it quite clear that workers of high morale do not need "discipline": on the contrary they need very often to be forced to stay away
from wor
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be found
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This is not the place to offer a detailed answer, but two points stand out in my mind. Firstly, if the approved and benefit societies exercised a proper oversight of their members in the club, and if they used the disciplinary powers they possess (or took stronger powers if need be), the problem would be solved by the only persons who can solve it—namely, the workers themselves. Secondly, managers can help both in their own works and by being ready to report obvious instances of the abuse of medical certification to the approved societies for their action. Managers know facts that doctors never learn.

But, of course, the real answer lies in the development and maintenance of "morale" in society. Doctors have an important contribution to make to this, but they can never deal with lax certification by their own unaided efforts.

Worcester. HOWARD E. COLLIER.

MASS MINIATURE RADIOGRAPHY

SIR,—Although a unit for "mass miniature radiography" is operating in this area I have yet to meet the person, apart from those more or less directly concerned with it, who has used these words in conversation. It is highly important to have as many people as possible radiographed, and needful that the scheme and its value be made known by being spoken about. We have begun this campaign of education and discovery by displaying a title containing words that are long, graceless, ill to utter, and to the man-in-the-street meaningless. If he wants to ask you about it he says with increasing embarrassment—"Mass—mass—mass— —" and gives it up; or "This X-ray business— —you know?" But one suspects that often he unwillingly suppresses the subject from conversation altogether because he cannot take the first fence—namely, "mass miniature radiography." And who can blame him? He is not concerned with the fact of the photos being in miniature, and "radiography" has a wide range of interpretation. (One person has remarked upon having had her photograph taken by wireless rays!)

Though one hesitates to add to the codes of daily speech I suggest that propaganda would be made more effective by use of the letters "MMR," or better, "MR." We have analogies elsewhere. People talk freely of "M and B" without knowing what these letters stand for, but they know something of the uses of the drug. I have frequently experienced momentary rebuff on meeting for the first time a patient whose lung had been collapsed. Reference to the "artificial pneumothorax" has produced a look of blank incomprehension, and then —"Oh!—you mean my AP." Now I am more careful to avoid this accusation of a shameless display of medical terminology, or is it of gross ignorance? To come nearer the subject, however much the purist dislikes it, the public has taken "TB" into common use in preference to the wieldy "tuberculosis."

So give them something simple from the start, such as "MR," or alternatively something that has a meaning for them, such as "mass X-ray examination" (or "MX"). The advertising value would be much higher, and advertising pays.

Midlands. TMO.

MEDICAL DEMOBILISATION

SIR,—Your admirably lucid leading article of June 9 has given us the essential facts with the reasons behind them, and we find that demobilisation on an age-service group basis is impracticable for RAMC officers, and for specialists in particular: with 40% of medical officers in

fighting forces, and the age increment must surely have
ger and more virile army
nless, of course, it could
doctor of 40 has some
ten groups before his
colleague aged 30, but the Americans have no such age bias in their release calculations. Surely, if medical officers are not to be allowed the privilege of demobilisation in their own group, the fair way of estimating precedence is by service alone.

In my Territorial hospital, every original medical officer has become a specialist or a commanding officer, and we have naturally had about six years' embodied service; yet with our age-service groups ranging up to 22, and the status of specialists, there are many of us with a long way yet to go. We are proud of our TA status despite the loss of our badges, and though we often convince ourselves otherwise, we would do the same again; but surely our pioneer work is done, and we only ask for a fair deal. First in, first out.

BLA W. G. MILLS.

On Active Service

RAF MEDICAL BRANCH AWARDS

OBE (MILITARY)

Group-Captains
R. H. STANBRIDGE
R. G. JAMES
Wing-Commander
J. B. WALLACE
Squadron-Leaders
H. O. HUGHES
D. N. MATTHEWS
A. RUSSELL

MBE (MILITARY)

Flight-Lieutenant J. HOOD

COMMENDED FOR BRAVE CONDUCT

Flight-Lieutenant D. CRICHTON

MENTIONED IN DESPATCHES

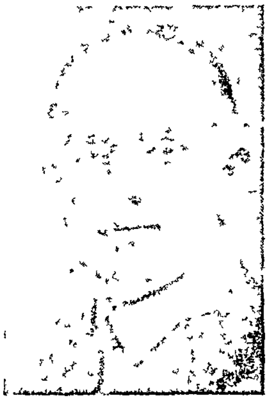
Air-Commodore F. J. MURPHY
Group-Captains
V. R. SMITH
L. FREEMAN
Wing-Commanders
C. C. BARKER
W. D. PLOCK
D. G. SMITH
L. L. INGRAM
J. C. TAYLOR
D. J. DAWSON
J. A. LENNOX
F. V. MACLAINE
O. PLOWRIGHT
K. B. REDMOND
J. L. ROCHE
P. A. WILKINSON
Squadron-Leaders
M. R. CHASSELS
A. P. GORRILL
G. L. [illegible]
L. D. A. HUSSEY
Squadron-Leaders (cont.)
W. L. JAMES
T. S. B. KELLY
J. H. MCKINLEY
R. E. MCKENZIE
D. H. G. MACQUAIDE
J. B. MURPHY
E. J. BLAIR
C. W. D. COLE
N. VERE-HODGE
E. H. JONES
J. H. MCCOY
I. M. MACGREGOR
F. L. E. MUSGROVE
A. J. S. BELL TAWSE
T. H. CULLEN, MBE
Flight-Lieutenants
A. H. CUTTING
G. H. DHENIN, GM
K. C. ECKERSLEY
A. H. FAIRBAIRN
R. M. EVANS ROBERTS

Obituary

ROBERT SHARP LAWSON

MA, MB EDIN., FRCS

Mr. R. Sharp Lawson died on May 27 at Leicester where he was senior surgeon to the Royal Infirmary. Born 59 years ago at Blackford in Perthshire, he graduated MB with first-class honours at Edinburgh University in 1910. After qualifying he became house-surgeon to Sir Harold Stiles, for whom he acted for a time as private assistant. In 1914 he gave up his post as resident surgical officer at the Dreadnought Hospital, Greenwich, to join the Navy, in which he served till 1918, taking his FRCS in 1916. After the war he spent some months working with Sir Robert Jones in Liverpool, where he developed a lasting enthusiasm for orthopædic surgery. He was appointed to the Leicester Royal Infirmary in 1919, and quickly established a reputation, both in general surgery and in orthopædics—indeed, he was really the founder of the present orthopædic and fracture service. An original member of the Provincial Surgical Club of Great Britain, he acted as secretary to it for two years. Shortly before the war a coronary thrombosis compelled him to rest for six months. But he returned to work at the outbreak of war with restored health and vigour, and, though he must have been well aware of the risk of a recurrence, he cheerfully coped with increased work and responsibility during the war years. His house-surgeons and colleagues will remember him as a gifted surgeon, and a valued consultant; and many surgeons all over the country will recall his courteous and polished manner, and his gift for friendship and hospitality.

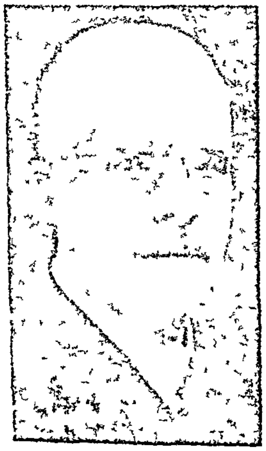


T. G. C.

THE LATE MR. BISHOP HARMAN

In supplement to last week's obituary notice the following appreciation reaches us from the medical department of the London County Council:—

It was 45 years ago, at the commencement of the present century, that Mr. Brudenell Carter after a visit to some of the London board schools pointed out in a letter to the *Times* how much of the efforts of the teachers was nullified by widespread unrelieved defect of vision amongst the school-children, many of whom appeared to be semiblind. This letter produced notable results. The School Board in 1901 instituted the regular testing of the children's eyesight by the teachers and appointed six "oculists" to supervise the tests. Mr. Bishop Harman was one of the six. Thus commenced an association with the education authority which produced far-reaching and beneficial results. With the sympathetic support of Dr. James Kerr. who was later appointed chief medical officer to the Board, Harman proposed numerous reforms which were duly carried out. Fine work hitherto practised in infants' schools was abolished; so were slates and pencils. Sewing by artificial light in girls' departments was prohibited. When the London County Council took over the work of elementary education Mr. Harman was appointed ophthalmic consultant.



The presence in the ordinary schools of a number of children with high myopia for whom the ordinary methods of education were harmful led Harman to the conclusion that it was necessary to establish special classes or schools with a curriculum and teaching methods specially devised to meet their needs. The first such school was established under Harman's supervision in 1908; and within a short time the whole of London was provided with special "myopic" schools, or, as they were later and better called, "sight-saving" schools. Harman himself devised special desks and apparatus for these schools, and it was due to his energy and drive that they became successful. His methods were adopted in large provincial centres and were followed enthusiastically by our trans-Atlantic cousins.

The lighting, both natural and artificial, of schools of all types was also a question which Harman made his own, and he was instrumental in securing the adoption of greatly improved standards. He also paid close attention to the type of school books, for which he formulated standards which were largely followed in school practice.

There is thus no part of the field of ocular care which Harman has not illuminated by his genius and knowledge, and the diminution of blindness and partial blindness from preventable causes in childhood has been greatly helped by his work.

Appointments

RAFTERY, J. D., D PHIL OXFD, FRCS: chief asst. to orthopædic department, Manchester Royal Infirmary.

SAMSON, LEOPOLD, MD HAMBURG: resident medical obstetric officer, Haymeads Hospital, Bishop's Stortford.

WILMOT, T. J., MB LOND.: acting surgical registrar, Middlesex Hospital, London.

King Edward VII's Convalescent Home for Officers, Osborne, Isle of Wight.—The following have been appointed to the civil consulting staff:

Sir FRANCIS FRASER, MD EDIN., FRCP
Brigadier W. ROWLEY BRISTOW, FRCS
Sir CLAUDE FRANKAU, CBE, DSO, MS LOND., FRCS
Prof. J. PATERSON ROSS, MS LOND., FRCS
G. T. MULLALLY, MC, MS LOND., FRCS
F. M. R. WALSHE, OBE, MD, D SC, FRCP
Brigadier D. EVAN BEDFORD, MD LOND., FRCP
Surgeon Captain W. D. W. BROOKS, DM OXFD, FRCP, RNVR

Births, Marriages and Deaths

BIRTHS

DEWAR.—On June 21, at Oxford, the wife of Dr. M. J. S. Dewar—a son.

FORD.—On June 19, at Derby, the wife of Dr. J. Cedric Ford—a daughter.

GARMANY.—On June 19, at Bristol, the wife of Surgeon Lieut.-Commander Gerald Garmany, RNVR—a son.

TOWNSLEY.—On June 21, at Norwich, the wife of Major Norman Townsley, FRCS—a son.

UNKAUF.—On June 19, at Winnipeg, Canada, the wife of Dr. B. M. Unkauf, Botleys Park War Hospital—a son.

WALLACE.—On June 9, at Simla, to Doris Barbara Wallace, FRCS (née Brown) the wife of Major R. J. Wallace—a daughter.

MARRIAGES

ALEXANDER—BAMFORD.—On June 15, at Charlton Kings, Angus Fraser Alexander, captain RAMC, to Helen Patricia Bamford, junior-commander ATS.

BUCHAN—MORGAN.—On June 18, at Woodford Wells, Forbes Buchan, captain, RAMC, to Nora Morgan.

CONDON—MORRIS.—On June 2, in London, Henry Arthur Condon, MRCS, to Margaret Elizabeth Morris.

FREETH—GOLDING.—On June 20, at Roundhay, Leeds, H. Derek Freeth, MB, flight-lieutenant RAFVR, to Margaret Joan Golding, SRN.

JOHNSTONE—HARRISON.—On June 20, at Cairo, Robert Maxwell Johnstone, MC, major RAMC, to Vivian Harrison.

ROCHE—GRANLUND.—On June 18, at Embleton, Northumberland, James Roche, lieutenant RAMC, to Ruth Mary Granlund.

DEATHS

BEATTIE.—On June 20, at Newcastle-on-Tyne, Thomas Beattie, MD, DCL DURH., FRCP, aged 77.

CLARKE.—On June 18, Leo Frederick Clarke, LRCPI, of Highgate Road, NW5.

COLBORNE.—On June 21, William John Colborne, CB, MRCS, surgeon rear-admiral.

DAVIES.—On June 18, at Tunbridge Wells, David Davies, MB LOND., aged 72.

EUSTACE.—On June 18, in London Hospital, George Wallace Eustace, MC, MD DUBL., JP, of Arundel.

GAYER-ANDERSON.—On June 16, at Lavenham, Robert Grenville Gayer-Anderson, Pasha, MRCS, major RAMC retd., of the Bayt el Kredlea, Cairo.

LAMONT.—On June 19, in Edinburgh, John Charles Lamont, CIE, MB EDIN., lieut.-colonel IMS retd.

PINHEY.—On April 23, Eustace Townley Pinhey, OBE, MB SYDNEY, medical superintendent, St. Pancras Hospital.

WALTON.—On June 21, Henry Beckles Gall Walton, MRCS, lieut.-colonel RAMC retd., formerly of Diss, Norfolk.

Notes and News

ROYAL MEDICAL BENEVOLENT FUND

Sir Arnold Lawson, in accepting the presidency at last week's meeting of the Fund, promised to follow in the footsteps of his predecessor, the late Sir Thomas Barlow, to whom many tributes were paid for his guidance and counsels. Dr. C. Luther Batteson was elected hon. treasurer, and the meeting was glad to welcome back Mr. R. M. Handfield-Jones as hon. secretary after his absence on war duties. Long work in various capacities was recognised by the election as vice- [illegible]

[illegible] subscriptions and donations in 1944 was £16,856, which represents an increase of £1752 over the previous year and an increase of £2321 over the pre-war figure for 1938. Legacies amounted to £24,463, which was about the same as in 1943. "This material help to the Fund and the endowment of its work for future years is of the greatest value to the committee, which appeals to all medical practitioners to remember the Fund in their wills."

Mention was repeatedly made of the excellent work of the Ladies' Guild, which, though carried on independently, is an essential part of the Fund and performs tasks no other body could undertake so well.

ANTIDOTE TO INDUSTRIAL WORK

MOST jobs done by the not very highly skilled are cramping both to mind and body. Palliatives such as rest pauses, cups of tea, and music-while-you work have proved their value and are now widespread in industry. The "purposeful physical training" demonstrated in London on June 22 by the Central Council for Physical Recreation is a further step forward. As Sir Wilfrid Garrett (Chief Inspector of Factories) said in his opening remarks, the Council's plans are to be welcomed as another aid to "making a factory more than a place to work in." Their primary aim is to provide suitably planned active recreation to counteract the mental and physical insults inflicted on the human organism. They claim that they can prevent boredom and apathy in the short run, and the physical defects and deformities that develop more insidiously.

The demonstration was ingeniously contrived to show (on the stage) workers engaged on their job, and (on the floor) workers learning to apply the antidote and obviously revelling in it.

Already 27 firms have lessons in work time, and representatives of some of the largest of them came to testify to the excellent results A commentary was given by Mrs H. M. Watt, the Council's adviser on industrial work The demonstration was given with intent to convert industrialists, but it is to be hoped that doctors were in the audience.

NEW CAMPAIGN AGAINST DIPHTHERIA

THE Ministry of Health point out that during the war more children have been killed by diphtheria than by bombs. The number of children under 15 in England and Wales who lost their lives as a result of air raids is 8000, while nearly 9000 died from diphtheria. This happened in spite of the fact that, since the national campaign for immunisation started, the annual total of deaths has been reduced year by year. For every three children who died from diphtheria before the campaign began in 1942, only one is dying today. But to maintain this improvement, and entirely defeat diphtheria as an epidemic disease, it is estimated that at least 75% of all children under 15 must be protected.

More than 5 million children have been immunised but 3 million remain unprotected. The Ministry have therefore launched a new summer campaign in favour of immunisation. The main aim is to get at least half a million infants protected before they reach their first birthday.

MEDICAL FILMS

TWO films of medical interest are now being shown to the public. In *Penicillin* (at the Warner Theatre, Leicester Square) we follow the progress of a battle casualty from the front line in Holland to final recovery in an EMS hospital in England, and observe that he receives penicillin all the way. As insertions in this integrating theme we are introduced to [illegible] part in establishing [illegible] see how it was dis [illegible] and manufactured on an experimental scale, and how it is manufactured in quantity today; we are shown the pure crystalline substance and told that it may soon be synthesised. The whole film is informative, clear, concise, and admirably unemotional; it gives due credit to the many different workers both in this country and the [illegible] was given [illegible] are shown [illegible] told which infections it is good for, and which it is powerless against. It is a film to be recommended to doctor and layman alike. Produced by John Taylor with Realist Film Unit; sponsored by ICI and the Therapeutic Research Corporation. running time 20 minutes.

Stricken Peninsula, the Ministry of Information release of the month for June, is concerned with war-ravaged Naples. It shows the chaos which greeted the liberating armies, and the measures they adopted to restore order. Among other items we see the measures taken to control the typhus outbreak—DDT dusting and typhus vaccine for all entering or leaving the area—and the hospitals reorganising their ruins and installing equipment which had been hidden during the German occupation. Produced by Paul Fletcher: running time 14 minutes.

POSTGRADUATE TRAINING AFTER RELEASE FROM SERVICES

As announced in THE LANCET of April 21 (p. 507), medical officers requiring postgraduate training on release from the Forces, [illegible] the cent[illegible] versity [illegible] they are living (for addresses see THE LANCET of June 16, p. 773). The Fellowship of Post-Graduate Medicine, of 1, [illegible]), inform us th[illegible], by supplying [illegible] are as follows:

St Andrews.—Prof. W. J. Tulloch, Medical School, Dundee.

[illegible] of Medicine,

[illegible] Sydney Smith,

[illegible] Obstetrics and Gynæcology, The University, Glasgow,

EPSOM COLLEGE

AT the 92nd annual general meeting of governors, held on June 22, Lord Leverhulme, the president, referred to the new Education Act and stated that the good news that Epsom College and all other public schools are safe in their independence at least for some years to come is a result of the patient work of the Governing Bodies Association, the Headmasters' Conference and other bodies. The new Burnham scale will affect salaries as a whole; but, as many feel that the new scale is not generous enough to graduates or to headmasters, most public schools will wish to pay more. A fair and reasonable post-war salaries scale at Epsom is now being considered. The fees too will have to be increased; they did not cover the cost just before the war, and a heavy rise in expenses must follow removal [illegible] on of the rep[illegible] in 1955 and [illegible] at opportun[illegible] to the founder and the fallen.

In dealing with the finances during 1944, Lord Leverhulme said that the small surplus on the school account would have been more by some £1300 but for the V1 bombs, boys not taking public examinations were sent home two or three weeks before the end of the summer term, and an allowance was made to parents. The number of boys during the year 1944-45 showed an increase of 15, and the school is likely to have its full complement of 500 in 1946.

University of Oxford

On July 21 the honorary degree of MA is to be conferred on Colonel L. M. Dyke, USAMC, officer in charge of the 91st General Hospital (Churchill Hospital).

Medical Honours

[illegible]

The order of Polonia Restituta (second class) has been conferred on Air Marshal Sir Harold Whittingham.

University of London

Names lately added to the university's roll of honour include the following:

Lieut.-Colonel J. D. F. Armstrong, RAMC (St. Mary's)
Captain F. A. S. Austen, RAMC (Middlesex)
Captain R. J. D. Carrick, RAMC (Middlesex)
Captain S. Conway, RAMC (Bart's)
Surgeon Lieut.-Commander H. de L. N. Davis, RNVR (Bart's)
Captain J. T. Doyle, RAMC (Guy's)
Surgeon Lieutenant H. E. D. Gale, RNVR (Bart's)
Squadron-Leader J. H. P. Gauvain, RAFVR (Bart's)
Surgeon Lieutenant R. L. Hall, RNVR (Bart's)
Captain S. C. H. Hood, RAMC (Middlesex)
Captain J. P. Irwin, RAMC (St. Thomas's)
Captain J. H. Keesey, RAMC (St. Thomas's)
Surgeon Commander H. de B. Kempthorne, RN (St. Thomas's)
Captain J. H. T. Lawton, RAMC (UCH)
Captain M. R. Mullins, SAMC (Guy's)
Captain J. A. Perkins, RAMC (London)
Captain P. A. Robinson, RAMC (Middlesex)
Captain J. A. Sandilands, RAMC (Bart's)
Flight Lieutenant G. E. T. Soden, RAFVR (Bart's)
Captain J. R. O. Thompson, GC, RAMC (King's & Bart's)
Major A. Waymouth, RAMC (Bart's)
Captain David Winser, MC, ARMC (Charing Cross)

Royal College of Surgeons of England

Prof. F. Wood Jones, FRS, has been appointed as the first Sir William H. Collins professor of human and comparative anatomy in the College. He will take up his duties on retiring from the chair of anatomy at Manchester University at the end of the year.

Professor Wood Jones, who is 66 years of age, graduated BSc in the University of London in 1903 and took his MB the following yea [illegible] anatomy at the London and St. [illegible] turer in anatomy in the Univers [illegible] After some Wanderjahre as a medical officer in the Far East he was appointed anthropologist to the Egyptian Government and took part in the archæological survey of Nubia. In 1910 he took his DSc Lond. in zoology and was appointed to the chair of anatomy at the Royal Free Hospital. In 1915, 1916, and 1919 he delivered Arris and Gale lectures at the Royal College of Surgeons, and in this last year he took up the chair of anatomy at Adelaide which he resigned on his appointment to the Rockefeller chair of physical anthropology in the University of Hawaii in 1927. He was elected FRS in 1925 and FRCS in 1930, when he left Hawaii to become professor of anatomy in Melbourne. During 1932-33 he acted as director of anatomy at Peiping Union Medical College. He took up his present appointment eight years ago. Professor Wood Jones served as a captain with the RAMC during the last war. His publications include books on corals, arboreal man, the mammals of South Australia, and sea birds, as well as *The Principles of Anatomy as seen in the Hand*. His *Unscientific Excursions* appeared in 1934, *Life and Living* in 1939, and *Design and Purpose* in 1942.

Summer School in Social Biology

The summer school which the British Social Hygiene Council is holding at University College, Nottingham, from July 28 to Aug. 11, under the direction of Prof. Winifred Cullis, D SC, is open to teachers, social workers and members of the general public interested in education and social problems from a biological angle. Courses of lectures will be given on biology in education, the biological approach to personality, the social aspects of health, the contribution of natural history to social biology, and food production and nutrition. Dr. Mary Collis and Dr. A. C. Tibbits will also give an account of the scheme of sex education which they have helped to set going in schools in Nottinghamshire. At the evening sessions lectures will be given on the broader application of biological knowledge to human life and culture, and speakers will include Sir Drummond Shiels, Dr. Otto May, and Dr. E. Glover. Further information may be had from the secretary of the council, Tavistock House North, London, WC1.

The Title "Nurse"

The provision under the Nurses Act, 1943, which restricts the use of the title "Nurse" to persons possessing one of the stated nursing qualifications, will come into force on Oct. 15. It will then become an offence for anyone to use this title unless he or she is on the State Register or is an enrolled assistant nurse, though children's nurses may still do so. The Act also defines the terms "Trained Nurse" (on the general part of the Register), "Maternity Nurse" (midwives), "Student Nurse" (training for State Registration), and "Pupil Assistant Nurse" (training for Assistant Nurses' Roll). From the same date, agencies supplying nurses must be licensed by local authorities, and must supply only those who are entitled to the title "Nurse."

British Medical Association

Dr. Robert Craig, the Scottish secretary of the BMA, is retiring under the age-limit. His appointment will not be filled until serving officers have had opportunity to answer the advertisement that will shortly appear.

Medical Society of London

On Monday, July 9, at 4 PM, there will be a clinical meeting at St. George's Hospital, SW1. A discussion of cases will follow at 5 PM.

Middlesex County Medical Society

At a meeting of the society to be held at 1, Wimpole Street, London, W1, at 5 PM, on Wednesday, July 4, Sir Reginald Watson-Jones will speak on accident services in the RAF.

Royal Sanitary Institute

At a meeting to be held at the Town Hall, Banbury, at 10.15 AM on Saturday, July 7, Prof. G. S. Wilson will read a paper on bacterial food-poisoning.

Anglo-Soviet Medical Council

Prof. Arnold Sorsby is attending the 220th anniversary celebrations of the Academy of Science of the USSR in Moscow as representative of the Council.

Birmingham Children's Hospital

Mr. Arnold Tunstall has been appointed house governor and secretary in succession to the late Mr. Harold Shrimpton.

Belgian Visitors to Britain

The fourth group of representatives of the Belgian Fondation Universitaire to visit this country as guests of the British Council have arrived in London. They include: Prof. M. Florkin (Liége), Prof. F. Albert (Liége), Prof. F. Bremer (Brussels), Prof. A. Castille (Louvain), Prof. J. C. Firket (Liége), Prof. H. R. Fredericq (Liége).

Typhus in United States Troops

Colonel Joseph F. Sadusk, Jr., of the US Typhus Commission, speaking in Texas on May 14, said that although American troops have been exposed to epidemic louse-borne typhus in many parts of the world, the US Army has had less than 5[illegible] cases of the disease, and not a single death.

Order of St. John of Jerusalem

The King has sanctioned the following promotions in, and appointments to, this order:

Knights.—Surgeon Rear-Admiral C. P. G. Wakeley, CB, FRCS; John Macintosh Wilson, MB; Air Marshal Sir Harold Whittingham, KCB, KBE, KHP.

Commanders.—Lie [illegible] Campbell Lloyd Fitz-Williams, CMG, MD, [illegible] Sir Ernest M. Cowell, KBE, CB, DSO, KHS; [illegible] Percy Tomlinson, KBE, CB, DSO, FRCP; David Leslie Beath, OBE, MRCS; Evan Lewys-Lloyd, MRCS; Theodore Howell Leggett, MD, RCAMCR.

Officers.—Leonard Duncan Porteous, MRCS; John Benjamin McKay, MB; Captain George Ferguson Shepherd, FRCSI; William Mailer, MB; Major Geoffrey Benion Thomas, FRCS, IMS; Charles Vere Nicoll, MRCS; Air Commodore Duncan McLaren, MB; Group Captain James Kyle, MRCS; Surgeon Commander John Stephen Elliot, MB; Surgeon Commander Arthur Edwards Ginn, MRCS; Arthur Percy Spark, MB; Samuel [illegible] eon Commander Carlton Henry Birt, MRCS [illegible] Buckley, MRCS; John Caradoc Ashton, M[illegible] Captain Archi[illegible] McCallum, OBE, MD; Lieut.-Colonel Lloyd Kirwood-Ledger, OBE, IMS; Colonel David Clyde, CIE, IMS.

Charity Organisation Society

On an appropriate date the title of this society is to be changed to The Family Welfare Association. It seeks general recognition as the "national family casework agency." Between the beginning of the war and the end of last year, over a million Londoners had brought their problems to its citizen's advice bureaus, and 55,000 London families had been assisted in every kind of trouble and difficulty. "The comfort and help given through this personal service make their continuance in the post-war period a vital necessity," and the society needs an increase of £15,000 a year in its income. Its address is 296, Vauxhall Bridge Road, London, SW1.

BIBLIOGRAPHY OF THE WAR YEARS.—*La Presse Médicale* for June 9, 1945, contains a classified bibliography drawn from five British and American journals in the years 1940–44, when France was largely cut off from outside news. Since the severance worked both ways, a bibliography of French medical work covering the same period would be useful in Britain and America.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

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Institutions and Corporations with the right to the prefix Royal will be found under that prefix, with the exception of Medical Societies, which are separately indexed under Societies. All Universities are indexed under the word Universities. (*A*) = *Annotation,* (*C*) = *Correspondence,* (*LA*) = *Leading Article,* (*ML*) = *Medicine and the Law,* (*NI*) = *New Invention,* (*O*) = *Obituary,* (*P*) = *Parliament and* (*R*) = *Review.*

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